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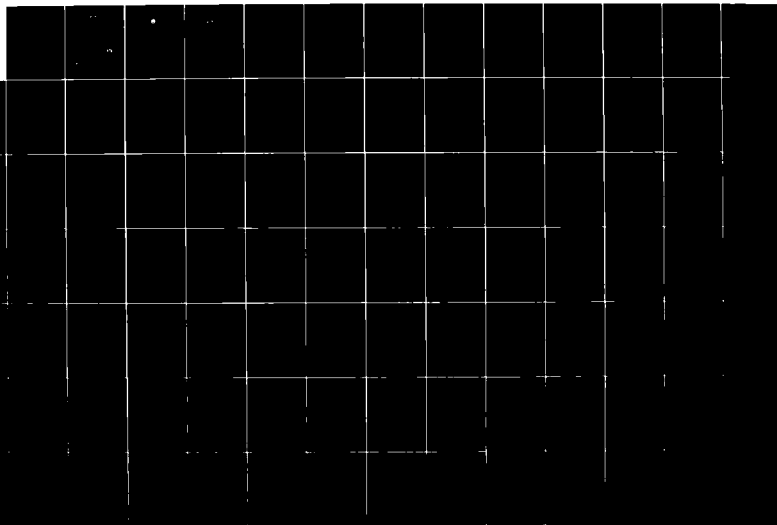
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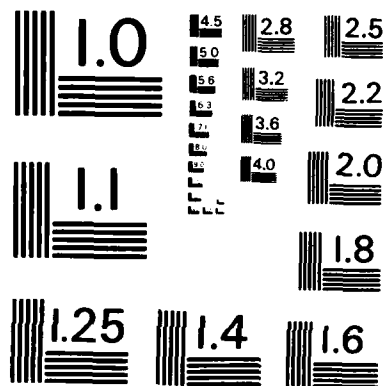
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Natural Disasters Organisation  
Department of Defence

# AUSTRALIAN DISASTER RESEARCH DIRECTORY

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NEW ZEALAND)

PROVISIONAL-1983

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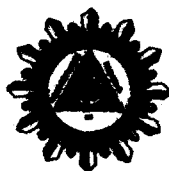


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Compiled and produced by the  
Australian Counter Disaster College,  
Mount Macedon, Victoria



## THE COLLEGE CHARTER

*"The role of the Australian Counter Disaster College is to contribute to the development of an efficient Australian counter-disaster capability by training selected personnel in counter-disaster and civil defence requirements; by fostering understanding and co-operation between appropriate elements of the community and by undertaking research into selected aspects of disaster."*

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**Natural Disasters Organisation  
Department of Defence**

# **AUSTRALIAN DISASTER RESEARCH DIRECTORY**

**(INCLUDING SOME CONTRIBUTIONS FROM  
NEW ZEALAND)**

THE UNITED STATES NATIONAL  
TECHNICAL INFORMATION SERVICE  
IS AUTHORISED TO  
REPRODUCE AND SELL THIS REPORT

**PROVISIONAL-1983**

AUSTRALIAN DISASTER RESEARCH DIRECTORY

CONTENTS

Foreword	A-2
The Australian Counter Disaster College and Counter-Disaster Research in Australia	A-3
Index of Contributors and Associates	A-12
Index of Contributing Organisations	A-26
Index of Disaster-related Research Fields	A-29
Research Entries	1
Non-Research Annex	139

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FOREWORD

by Director - Australian Counter Disaster College

To fulfil its Charter, the Australian Counter Disaster College is required to contribute to the development of an efficient Australian counter-disaster capability by training selected personnel in counter-disaster and civil defence requirements; by fostering understanding and co-operation between appropriate elements of the community and by undertaking research into selected aspects of disaster.

Since its inception in 1956, the College - then known as the Australian Civil Defence School - has conducted a variety of residential courses, seminars and briefings on disaster-related topics for more than 26,000 professional and volunteer students from all walks of life. Many came from Commonwealth, State, or local government or government-sponsored organisations, but a significant number were from other nations. The College has also devoted considerable effort to increasing the public's awareness of the potential disaster hazards which attend their daily lives and to fostering co-operation and understanding between the many and diverse statutory, professional and volunteer organisations who become involved in preparing for and responding to disaster situations. Although the College Charter has long required it to research selected aspects of disaster, it was unable to do so meaningfully until a Research Officer was appointed in 1980.

The first major task assigned to the Research Officer was to determine the extent of disaster research completed, being conducted or contemplated in Australia. This task involved a survey, the results of which led to the compilation of a disaster research directory which will, in turn, allow voids or duplication in research effort to be identified. This Australian Disaster Research Directory is now published in provisional form, in the hope that it will stimulate additional input for the first edition of the Directory, to be published in 1985. Thereafter, the Directory will be re-published at intervals, as the need arises, to maintain its currency.

I would value readers' comments on this Directory; particularly those related to its intended purpose and likely use by the disaster research fraternity; and, any additional data you may wish to provide for inclusion in it.

I hope that the Directory will be warmly received and that it will increase the general awareness of the need for disaster research and of this College's efforts to fulfil its Charter.

Mount Macedon,  
1st June, 1983.

THE AUSTRALIAN COUNTER DISASTER COLLEGE  
AND COUNTER-DISASTER RESEARCH IN AUSTRALIA

INTRODUCTION

According to the Charter of the Australian Counter Disaster College, an important part of its role in contributing to the development of an efficient Australian Counter-Disaster capability is by undertaking research into selected aspects of disaster. This research phase of the College's activities is a new endeavour, and for its efficient execution it was necessary to determine the nature and scope of disaster research which, both completed and ongoing, contributes to the overall Australian counter-disaster capability. The information which was acquired has been compiled to form this publication, the Australian Disaster Research Directory (provisional version (1983)), which has been widely disseminated among its contributors and other interested parties. The establishment of this Directory should therefore -

- \* ensure that those involved in counter-disaster research activities are aware of who is doing what, and where;
- \* help to avoid duplication or overlapping of effort in counter-disaster research;
- \* identify where further research is deemed to be required, and
- \* disseminate other relevant matters, such as information relating to counter-disaster training activities, data, etc., which are available in Australia.

This Directory contains names, addresses, and contact telephone numbers of entrants, as well as a brief abstract of disaster research, which includes behavioural, psychological, social and physical sciences.

THE SURVEY OF AUSTRALIAN COUNTER-DISASTER RESEARCH

Disaster oriented research or other activity is carried out in many institutes such as Universities, Colleges of Advanced Education, and in some Government Departments. In order to assess the scope of disaster research the following tactics to make contact with the appropriate people were used.

- \* a questionnaire composed of some twenty questions was mailed to the 83 tertiary institutes including the 19 Universities, and the 64 Colleges and Institutes of Advanced Education, Institutes of



A-4

Technology, Military Colleges and some T.A.F.E. Because much research in many disciplines is carried out in such institutes, the questionnaire approach was deemed an appropriate technique to locate disaster-oriented research, and the response to the questionnaire survey proved this to be a valid assumption.

- \* a note in "SEARCH" which is the Journal of the Australian and New Zealand Association for the Advancement of Science. This note requested disaster research workers, or those who knew of other people working in counter-disaster related fields, to contact the Research Officer at the Australian Counter Disaster College. This note was expected to come to the attention of virtually all practising natural and physical scientists throughout Australasia.
- \* a similar note in the Institute of Australian Geographers' Newsletter;
- \* a note in "NEXUS", the newsletter of the Sociological Association of Australia and New Zealand (SAANZ);
- \* an open letter, placed on the public notice board, at the Geographers' Conference held at the Mitchell C.A.E. in Bathurst NSW during August 1981;
- \* notes placed in staff and campus newsletters of most Universities;
- \* visits to selected tertiary Institutes and Research Centres along the eastern part of Australia;
- \* various telephone calls.

#### THE QUESTIONNAIRE

Of the 83 Institutes, including the 19 Universities and 64 Colleges of Advanced Education, to which copies of the questionnaire were mailed, 18 made no acknowledgement whatsoever. Of the remaining 65 Institutes, 29 acknowledged receipt of the questionnaire but gave a nil response; that is, they stated that no disaster-oriented research was carried out in their Establishments. However 36 Institutes gave positive responses and returned in the first instance some 69 questionnaires containing in many cases much information concerning the nature of the counter-disaster research being carried out, the names of members of research teams and other contacts, publication lists, and other relevant material. Several questionnaires were returned from Monash University alone, representing the Departments of Civil Engineering, Mechanical Engineering, Chemical Engineering and Geography. A good response was also obtained from the University of New South Wales; namely from the Departments of Analytical Chemistry,

A-5

Mining Engineering, Water Engineering, Transport Engineering, and Geography. The Centre for Disaster Studies at James Cook University naturally gave a formidable response.

Of the 18 non-responding Institutes there were some, eg, the Universities of Tasmania, Western Australia, and Wollongong from which responses were expected. It seemed probable therefore that the questionnaire approach was by no means totally efficient at determining the scope of counter-disaster research in Australian tertiary institutes. In order to increase the number of contacts not only in tertiary institutes but also in Government Departments and other organisations, notices advertising our Directory project were openly published in University staff newsletters, and various professional journals. This resulted in additional responses coming from Universities including Wollongong, and from the Victorian Department of Planning, the Tasmanian Department of Mines, the Traffic Authority of New South Wales and the Western Australian State Health Laboratory Services.

#### A SELECTION OF CURRENT COUNTER-DISASTER RESEARCH

Apart from the general areas of research on potential disaster agents such as cyclones, floods, earthquakes, etc, the following list indicates the present range of specialist counter-disaster research extracted from the survey:

- \* mathematical modelling  
(storm surge, oil spills, bushfires  
including smoke dispersion modelling)
- \* landslides, including the provision for  
legislation for proclamation of landslip zones
- \* social and administrative consequences of disasters
- \* equity in natural disaster relief
- \* human behaviour under stress
- \* human adjustments, behavioural aspects, bereavement
- \* nursing in emergency and disasters
- \* hazard awareness
- \* legal implications
- \* insurance aspects
- \* earthquake monitoring
- \* prediction (earthquake, cyclone etc)
- \* atmospheric

A-6

- \* evaluation of meteorological warnings with respect to public response
- \* desertification
- \* drought
- \* famine warning systems
- \* rainfall insurance/income stabilization
- \* studies of traffic accidents
- \* causes of spinal injuries as a result of road accidents
- \* safety in process industries
- \* counter-disaster planning
- \* soil erosion
- \* toxic pollution of soil
- \* disease control in forests
- \* air and water pollution
- \* epidemiology of disease
- \* gas and dust ignitions
- \* hydrology
- \* resistant structural design (earthquakes, floods, cyclones)
- \* risk mapping (earthquakes, floods, storm surge, cyclone, fire)
- \* social and physical effects of nuclear attack
- \* volcanic hazards
- \* statistics of abnormal sea levels
- \* management of high level nuclear wastes
- \* simulation exercises for training
- \* environmental monitoring by satellite
- \* the nature of fiascos

AREAS WHERE FURTHER RESEARCH IS REQUIRED

The disaster research survey questionnaire sought to determine where respondents felt there were research voids. The following is a list of the more unusual areas of possible future work.

- \* increased work on risk vulnerability mapping with reference to earthquakes, bushfires, floods, and storm surges
- \* the use of remotely sensed imagery by artificial satellite in order to monitor the status of the environment
- \* the measurement of earthquake stress magnitude and direction covering as large an area of the Australian continent as possible
- \* a study of the long term effects of adjustments to disasters, particularly with respect to their affecting various economies
- \* the pollution of soil by animal wastes applications
- \* administrative response patterns i.e., how does administration cope with the non-normal situation in the post-disaster phase?
- \* the role of emergent groups that appear in the post-disaster phase
- \* the social and behavioural effects of "chronic" disasters i.e., those disasters that are very long term such as droughts that persist for years
- \* food crisis management training (this of course applies mainly to poorer or third-world economies and is not therefore related to the Australian scene, unless one considers the advent of say a devastating exotic disease or nuclear war)
- \* country versus suburban planning
- \* the effect on human occupation of soil erosion and landslips
- \* water resources projects and their effects on the semi-arid parts of Australia
- \* the study of causes of spinal injury with respect to the worthwhileness of prevention schemes
- \* perception studies relating to and identifying the vanity of resource managers whose reputations are at risk and whose actions contribute to the magnitude of the disaster

A-8

- \* effectiveness of welfare plans
- \* oil spill control
- \* political and legal aspects, including the effects of politics at the local level upon mitigation, adjustment and recovery
- \* how best to operationalise among front line personnel based on the results of research already completed
- \* psychological factors affecting those working in the field
- \* the effect of excitement and sensationalism on workers, researchers, observers, and potential victims
- \* hazards due to accidental release of liquid pollutants such as sewage and agricultural and industrial effluents
- \* vulnerability of large industrial and residential complexes to modern weaponry in the event of war
- \* failure of off-shore structures, particularly oil rigs
- \* to contrast the administrative response patterns in the four Australian cities which have suffered significant natural disasters over the last fifteen years (Hobart, Brisbane, Townsville, Darwin) to determine strengths and weaknesses of these responses
- \* Impact of environmental change on present and future disaster strategies

#### SOME QUESTIONNAIRE STATISTICS

Some of the questionnaire sought to determine various attitudes, extent of special resources used in disaster studies, course work, etc at the tertiary institutes. The following gives a resume of these factors.

Of the 74 questionnaire respondents,

- \* 32 stated that undergraduate instruction in disaster studies was given at their institution
- \* 15 stated that management personnel courses, seminars, and workshops were given
- \* 7 had courses involving counter-disaster planning
- \* 4 on disaster administration
- \* 7 on flood mitigation and land usage
- \* 4 on post-disaster welfare planning
- \* 8 on public awareness

- \* 1 on earthquake prediction
- \* 7 on model representation (i.e. computer simulation)
- \* 7 on psychological, behavioural, and sociological aspects
- \* 4 on aspects of man-made disasters
- \* 9 gave courses on the use of computer models for prediction

Other aspects of courses conducted included

- \* landslides and landslide potential
- \* economic problems
- \* safety
- \* environmental stability
- \* mine stability
- \* train derailment studies
- \* wind, ocean, and coastal engineering
- \* general disaster studies
- \* courses for the State Emergency Service

With regard to special resources used in disaster studies at the tertiary institutes

- \* 28 reported the use of computers
- \* 6 said that wind tunnels and structural models were used
- \* 7 used flood, storm surge, and oil spill models
- \* 13 used surveys

Other special resources reported included

- \* remotely sensed imagery
- \* field interviews
- \* mapping
- \* tidal analysis facilities
- \* gas and dust analysis equipment
- \* aerial photography

A-10

- \* tapping and systematizing local knowledge

With regard to constraints affecting research work

- \* 46 identified funding restrictions as a limitation
- \* 32 identified staff ceilings
- \* 8 data collection difficulties
- \* 6 lack of co-operation
- \* 4 lack of time, and order of priorities

Other constraints cited included

- \* lack of high calibre students
- \* lack of adequately prepared matriculants
- \* lack of Government awareness to problems of disaster

#### CONCLUSION

It is evident from the foregoing that the questionnaire survey has so far been a very effective method of collecting data with regard to Australian disaster research, with lesser contributions resulting from notices in newsletters and other publications. Visits to institutions and telephone calls by the College's Research Officer have also contributed to data collection. Regrettably it is difficult to be sure that all possible contributors have been included in the survey, and indeed workers will be leaving the disaster research field and others will enter it as time progresses. Hence this Directory must of necessity be the first edition of an ongoing and an updated series. Anyone who works in hazard or disaster-related fields and who has not been included in this survey is invited to contact -

The Research Officer,  
Australian Counter Disaster College,  
Macedon Victoria 3440

Telephone (054) 26 1205

so that a contribution can be recorded for the second edition of the Directory. Likewise suggestions for improvement of the Directory will be welcomed.

#### DIRECTORY FORMAT

For convenience of compilation, contributors entries are in alphabetical order of Institute. To assist the reader in locating an Institute, or a research worker, or those research workers in a given field such as floods, three indexes are located at the front of the Directory.

These are entitled

Index of Contributors and Associates

Index of Organisations

Index of Disaster Related Research Fields

To assist the reader in locating a contributor in the text, an asterisk indicates the first occurrence of the contributor's name.

The entries vary considerably in content and reflect the amount of information supplied by the individual contributor. Each entry is headed by the contributor's Organisation, his or her name, title and position, and telephone number (where possible a direct line is given). Some contributions that are not strictly research but are considered of interest to disaster research workers have been included in a Non-Disaster Research Annex.



INDEX OF CONTRIBUTORS AND ASSOCIATES

A-12

Page

Accredited Technical Experts in Natural Disasters (ATEND) (Western Australian State Emergency Service)	147
Agnew, Associate Professor J B Dept Chem Eng, Monash Univ	91
Aitken, Mr R J Director, SES Victoria	20
Allen, Dr G H Lecturer, Dept Elec Eng, James Cook Univ	49
Anderson, Dr D RMC Duntroon	102
Anderson, Mr J L Sen Lecturer, Economics School, La Trobe Univ	78
Andrews, Mr Kevin Young Lawyers, Law Inst of Vic	149
Armstrong, Mr D Post-Grad Student, Dept Geog, Waikato Univ	133
Arnold, Dr Trevor Head, Dept Phys Ed, Bendigo CAE	139
ATEND (Accredited Technical Experts in Natural Disasters) (Western Australian State Emergency Service)	147
Baker, Mr A S Dept Civil-Systems Eng, James Cook Univ	51
Balint, P Sen Lecturer, Dept Struct Eng, Univ of NSW	122
Barber, Mr J Assist Chief Officer, Research Sect, CFA	22
Barbour, R Post-Grad Student, Dept Geog, Waikato Univ	133
Beer, Dr Thomas Associate, Natural Systems Research	95
Bell, Dr F C Sen Lecturer, School Geog, Univ of NSW	120
Bennett, Professor John M Dept Computer Science, Univ Sydney	132
Beresford, F D CSIRO Building Research, Highett, Vic	29

A-13	Page
Best, Mr R J Dept Civil-Systems Eng, James Cook Univ	51
Bird, Dr T S Lec, Dept Elec Eng, James Cook Univ	49
Bitmead, Dr R R Lec, Dept Elec Eng, James Cook Univ	49
Black, Mr R G Sen Lec, Civil Eng, QIT	99
Blackman, Dr D R Sen Lec, Dept Mech Eng, Monash	86
Blong, Dr Russell Sen Lec, Earth Sciences, Macquarie Univ	80
Blunden, Professor W R (retired) Dept Transport Eng, Univ NSW	121
Boughton, Mr G N Cyclone Testing Station, James Cook Univ	51 55
Bourne, Mr S J Cyclone Testing Station, James Cook Univ	51
Bouwhuis, Mr Ron Associate, Natural Systems Research	95
Britton, Mr Neil R Dept Behav Sciences, James Cook Univ	48 55
Brown, Dr Kenneth A Sen Lec, Dept Oral Biol, Adelaide	107
Buchanan, Mr R P Dept Civil-Systems Eng, James Cook Univ	51
Burke, Dr David D Director, Spinal Unit, Austin Hospital, Vic	77
Burley, Dr H T Sen Lec, Econometrics, La Trobe Univ	77
Butler, Mr J R G Lec in Economics, North Brisbane CAE	130
Butler, Mr W School Social Science, Flinders Univ	38
Button, Mr C R Lec, Dept Civil Eng, QIT	99

	A-14
	Page
Campbell, Mr P A Dept Civ & Aero Eng, RMIT	101
Cape, Major-General T Aust. Red Cross Society	19
Carter, Air Vice-Marshal W Disaster Consultant, Macedon, Vic	19 140
Catchpole, Dr E A RMC Duntroon	102
Catchpole, Mrs W RMC Duntroon	102
Centre for Information and Research on Disasters and Natural Hazards (CIRDNH), CIT	17 19
Chamberlain, Professor Edna Dept Social Work, Univ Queensland	127
Chant, Ms Ngaire NSW Disaster Welfare Service	146
Chapman, Dr David Lec, Dept Geog, Univ Sydney	131
Chapman, Professor Tom G Dept Water Eng, Univ NSW	125
Cheney, Mr N P (Phil) CSIRO Forest Research	31
CIRDNH (Centre for Information and Research on Disasters and Natural Hazards, CIT	17 19
Clarke, Dr Magnus Lec, School Social Sciences, Deakin Univ	33
Codner, Dr G C Lec, Dept Civil Eng, Monash Univ	93
Colman, Mr E J Dept Civil & Systems Eng, James Cook Univ	51
Connell, J Economics, Univ Melbourne	111
Cordery, Associate Professor I Dept Water Eng, Univ NSW	125
Corner, Mr J P Lec, Dept Civil Eng, QIT	99

A-15	Page
Cousens, Mr D R School of Science, Griffith Univ	41
Crozier, Dr Michael Dept Geog, Victoria Univ, Wellington	134
Currey, Dr Bruce School Social Sciences, Flinders Univ	34
Curson, Dr P H Sen Lec, School Earth Sciences, Macquarie Univ	80
Dalitz, Mrs E Ruth Hon Sec, Natural Disasters Action Committee	19 141
Davey, Mr Colin Lec, Dept Human Studies, Sydney Teachers College	104
Davies, Professor J L Dept Geog, Macquarie Univ	80
de Mestre, Dr N J RMC Duntroon	102
Dillon, Professor John Economic Studies, Univ New England	19
Dingsdag, Mr Donald Dept Hist, Univ Wollongong	135
Doessel, Mr D P Lec in Economics Univ Queensland St Lucia	130
Douglas, Dr L Sen Lec, School Agric, Univ Melbourne	110
Dunbaven, Dr M Dept Civil & Systems Eng, James Cook Univ	51
Eberbach, Mr P School Agric, Univ Melbourne	110
Eckersley, Mr J D Lec, Dept Civil & Systems Eng, James Cook Univ	50 55
Elkington, Dr John S H Lec, School Science, Griffith Univ	41
Epstein, Mr Judd A Sen Lec, Law Faculty, Monash Univ	85
Ericksen, Dr Neil J Sen Lec, Dept Geog, Univ Waikato	133

	A-16 Page
Fisher, Dr A J Dept Transport Eng, Univ NSW	121
Foster, Associate Professor D N Dept Water Eng, Univ NSW	125
Fox, Mr Stan Cameron Lec in Community Work SACAE (Salisbury)	103
Fraser, Dr D Sen Lec, Dept Struct Eng, Univ NSW	122
Fraser, Mr P School Agric, Univ Melbourne	110
Frawley, Mr K Tutor , Dept Geog, James Cook Univ	49
Gabric, Dr Albert Lec, Dept Mathematics, CIT	16
Garvey, Mr M F Fire Research Unit, CFA	23
Gibson, Mr Gary Head, Seismology Research Unit, PIT	97
Gibson-Wilde, Dr B C Sen Lec, Dept Physics, James Cook Univ	48
Gilmore, brigadier Ian Director, Australian Counter Disaster College	19
Gonano, Mr D Dept Civil-Systems Eng, James Cook Univ	50 55
Graham, M Dept Geog, Univ Waikato	133
Green, Dr David G Research School Pacific Studies, ANU	4
Greenaway, Mr Mark Centre Resource & Environmental Studies, ANU	1
Greenhalgh, Dr Stewart A Lec, School Earth Sciences, Flinders Univ	37
Grundy, Associate Professor Paul Dept Civil Eng, Monash Univ	93
Guvanasen, Dr V Dept Civil-Systems Eng, James Cook Univ	51

A-17	Page
Handmer, Mr J W Dept Geog, ANU	5
Hargreaves, Mr Ian Associate, Natural Systems Research	95
Harper, Mr B A Dept Civil-Systems Eng, James Cook Univ	50
Harvey, Dr N Dept Geog, Univ Adelaide	49 106
Healy, Dr Terry School Earth Sciences, Univ Waikato	134
Heaney, Dr A Sen Lec, Dept Struct Eng, Univ NSW	122
Heath, Tom Head, School Built Environment, QIT	100
Heathcote, Dr R L Reader in Geog, Flinders Univ	19 38
Heron, Dr M L Sen Lec, Dept Physics, James Cook Univ	48
Hill, Mr Dean L WA State Advisory Committee (ATEND Scheme)	148 149
Hilton, Dr J M N Public Health Department of Western Australia	138
Hinwood, Associate Professor John B Dept Mech Eng, Monash Univ	88
Hirst, Dr M J S Sen Lec, Dept Civil Eng, Adelaide Univ	105
Hobbs, Dr J E Sen Lec, Dept Geog, Univ New England	19 116
Holder, Dr G A Sen Lec, Dept Chem Eng, Monash Univ	91
Holmes, Dr J D Sen Lec, Dept Civil-Systems Eng, James Cook	50
Hopley, Associate Professor D Dept Geog, James Cook Univ	49
Horne, R Dept Sociology, Wollongong Univ	135
Howell, Associate Professor D T Dept Water Eng, Univ NSW	125

	A-18
	Page
Humphreys, Max NSW Traffic Authority	96
Humphries, Dr Robert B CRES, ANU	1
Hunter, Lucy L Research Fellow, Law Faculty, Monash Univ	85
Hyde, Dr R Sen Lec, School Earth Sciences, Macquarie Univ	81
James, Dr M K Lec, Dept Civil-Systems Eng, James Cook Univ	50
Jarvis, Mr Ken NSW Dept Youth & Community Services	20
Johansons, Dr H A Dept Civil & Aero Eng, RMIT	101
Johnson, Mr R K H Head, School Environ Design, Canberra CAE	15
Jones, Professor E L School Economics, La Trobe Univ	78
Jones, Mr Stuart Director, Natural Systems Research, Hawthorn, Vic	95
Kabaila, Associate Professor A P Dept Struct Eng, Univ NSW	122
Kearney, Professor G E Head, Dept Behav Sciences, James Cook Univ	45 48
Keller, Dr R J Sen Lec, Dept Civil Eng, Monash Univ	93
Kemp, Mr R Lec, Bus Studies, Ballarat CAE	6
Keulemans, Dr T School Social & Behav Studies, CIT	20
Kneen, Dr P Sen Lec, Dept Struct Eng, Univ NSW	122
Landauer, Dr A A A Forensic Pathology, Univ Western Australia	138
Langton, Ms B Dept Geog, Univ Sydney	131

A-19	Page
Laureffson, Professor E M	93
Head, Dept Civil Eng, Monash Univ	
Leicester, Dr R H	28
CSIRO Building Research, Highett, Vic	
Lennon, Professor G W	39
Chairman, School Earth Sciences, Flinders	
Lester, Mr Les	19
Insurance Council of Australia	143
Lewis, Mr R A	41
School of Science, Griffith Univ	
Linacre, Associate Professor E T	81
School Earth Sciences, Macquarie Univ	
Lloyd, Professor A G	111
School Agric & Forestry, Melbourne Univ	
Lord, Mr R	145
NRMA Insurance	
Luscombe, Mr G	123
School Geog, Univ NSW	
Lyons, Dr T	94
Lec in Atmospheric Science, Murdoch Univ	
McCloy, Mr Keith R	96
NSW Dept Agriculture	
McDonald, Dr Neil S	5
Sen Lec, Dept Geog, ANU	19
McKelvie, Mr Ian	16
Tutor, Dept Chemistry, CIT	
McKenzie, Mr R	48
Dept Physics, James Cook Univ	
McKinnon, Miss Margaret	98
Acting Head, School Nursing, PIT	
Mathias, Mr Malcolm H	21
CIRDNH member	84
Maynes, Mr K J	23
Regional Officer, CFA-Victoria	
Mein, Dr R G	93
Sen Lec, Dept Civil Eng, Monash Univ	
Melbourne, Professor W H	86
Chairman, Dept Mech Eng, Monash Univ	



	A-20 Page
Melchers, Dr R E	92
Sen Lec, Dept Civil Eng, Monash Univ	93
Milliken, Mr E P	32
Sen Lec, Humanities, Darwin Community College,	
Milne, Dr Gordon	127
Clinical Psychologist, Cairns	
Mitchell, Mr G M	50
Dept Civil-Systems Eng, James Cook Univ	
Mitchell, Mr P B	80
School Earth Sciences, Macquarie Univ	
Morris, Ms Wendy	137
Vic State Govt Dept Planning	
Munro, Mr R D	121
Sen Lec, Dept Transport Eng, Univ NSW	
Murchie H	104
Tas State Govt Dept Mines	
Murray, Mr Ian G	17
Lec Welfare Studies & Co-ordinator CIRDNH CIT	
Murray, Professor N W	87
Dept Civil Eng, Monash Univ	93
Myhra, Dr S	41
School Science, Griffith Univ	
Nairn, Professor M E	144
Dean, School Vet Studies, Murdoch Univ	
Nash, Dr A H	148
Dean, Faculty Eng & Surveying, WAIT	149
Natural Disasters Action Committee (NDAC)	141
Mrs E Ruth Dalitz, Honorary Secretary	
Nichols, Mr David	23
Fire Research Unit, CFA-Victoria	
O'Connor, Professor Desmond	94
School Environ & Life Sciences, Murdoch Univ	
Oliver, Professor John	20
Head, Dept Geog, James Cook Univ	42, 45
Owens, Dr Ian	134
Dept Geog, Univ Canterbury, Christchurch, NZ	

A-21	Page
Packham, Mr David	16
Water Studies Centre, CIT	21
Pain, Dr Colin F	123
Lec, School of Geog, Univ NSW	
Parbery, Dr D G	112
Dean, School Agric & Forestry Univ Melbourne	
Parkes, Mr T	102
RMC Duntroon	
Parkhowell, Mr Ross	20
Vic Dept Community Welfare Services	
Parr, Dr Arnold R	108
Sen Lec, Dept Sociology, Univ Canterbury NZ	
Paul, Dr Dale C	103
Assistant Director (Academic) SACAE (Salisbury)	
Peterson, Dr J A	20
Sen Lec, Dept Geog, Monash Univ	85
Phillips, Mr D I	103
Sen Lec, Dept Civil Eng, Swinburne Inst Tech	
Phillips, Dr H R	124
Sen Lec, School Mining Eng, Univ NSW	
Pickup, Dr G	20
SRS, CSIRO Wilflife & Range Lands Research, NT	
Piggin, Dr Stuart	135
Sen Lec, Dept History, Univ Wollongong	
Pilgrim, Associate Professor D H	125
Dept Water Eng, Univ NSW	
Pillans, Mrs A	49
Dept Geog, James Cook Univ	
Pocock, Dr Derek A	138
Public Health Dept Western Australia	
Popovic, Ms Vesna	100
Sen Lec, School of Built Environ, QIT	
Potter, J B	109
Registrar, Univ Melbourne	
Potter, Professor O E	91
Chairman, Dept Chem Eng, Monash Univ	
Pratt, Mr B T	23
Fire Research Unit, CFA-Victoria	

## Page

Price, Dr J Head, Dept Psychiatry, Univ Queensland	129
Ramsay, Dr G C CSIRO Building Research, Highett, Vic	29
Rangan, Associate Professor B V Dept Struct Eng, Univ NSW	122
Raphael, Professor Beverley Medical Faculty, Univ Newcastle	115
Reardon, Mr G F Cyclone Testing Station, James Cook Univ	51
Reid, Mrs J Innes Dept Behav Sciences, James Cook Univ	48
Reser, Dr J P Sen Lec, Dept Behav Sciences, James Cook Univ	48
Riazi, Dr H School Agric & Forestry, Univ Melbourne	110
Riley, Dr S J Lec, School Earth Sciences, Macquarie Univ	80
Ronan, Dr M Head, Dept Applied Sociology, CIT	21
Ross, Dr Graeme Head, Dept Mathematics, CIT	16
Roxborough, Professor F F Head, School Mining Eng, Univ NSW	124
Roy, Mr R Dept Civil-Systems Eng, James Cook Univ	50 55
Schwerdtfeger, Professor Peter School Earth Sciences, Flinders Univ	40
Segall, Professor R L School of Science, Griffith Univ	41
Sharp, Dr B B Chairman, Dept Civil Eng, Univ Melbourne	113
Sharp-Paul, Mr Alastair Director, Natural Systems Research	95
Shields, A E Registrar, Univ of Adelaide	105

A-23	Page
Shipman, Mr A	49
Dept Elect Eng, James Cook Univ	55
Short, Ms Patricia	127
Singh, Dr B	115
Sen Lec in Psychiatry, Univ Newcastle	
Smart, Dr R St C	41
School of Earth Sciences, Flinders Univ	
Smith, Mr David Ingle	1
Sen Fellow, CRES ANU	
Smith, Dr D L	106
Dept Geog, Univ Adelaide	
Smythe, Professor Lloyd E	123
Head, Dept Anal Chem, Univ NSW	
Sobey, Dr R J	50
Sen Lec, Dept Civil-Systems Eng, James Cook Univ	
Stark, Professor K P	45
Head, Dept Civil-Systems Eng, James Cook Univ	49
State Advisory Committee for the Accredited Technical Experts in Natural Disasters (ATEND) Scheme WASES	139
Steen, Mr W E	50
Dept Civil-Systems Eng, James Cook Univ	55
Stevenson, Mr P C	104
Tas State Govt Dept Mines	
Strachan, Mr David	95
Associate, Natural Systems Research	
Stride, Mr H	49
Dept Geog, James Cook Univ	
Svensson, Professor N L	124
Dean, Faculty Eng, Univ NSW	
Tan, Dr S	20
St Vincent's Hospital, Melbourne	
Taylor, Professor Geoffrey	1
Director CRES, ANU	
Tennakoon, M V A	38
PhD Stud, School Social Science, Flinders Univ	
Tindall, Mr J I	121
Dept Transport Eng, Univ NSW	

	A-24
	Page
Trollope, Professor D H	45
Deputy Vice-Chancellor, James Cook Univ	49
Tronc, Dr Keith	94
Assist Director, Mt Gravatt CAE	
Turner, Mr H J (retired)	121
Dept Transport Eng, Univ NSW	
Turner, Dr P S	41
School of Science, Griffith Univ	
Twidale, Dr C R	106
Reader, Dept Geog, Univ Adelaide	
Volker, Dr R E	50
Sen Lec, Dept Civil-Systems Eng, James Cook	
Walker, Associate Professor G R	45
Dept Civil-Systems Eng, James Cook Univ	50
Ward, Professor J F	45
Head, Dept Physics, James Cook Univ	
Watkins, Dr J R	100
Head, Dept Geology, RMIT	
Watson, Dr I G	81
Lec, School Earth Sciences, Macquarie Univ	
Webster, Professor R W	109
Chairman, Dept Community Health, Univ Mell	
Wesson, Mr Vaughan	97
Seismology Research Centre, PIT	
Western Australian State Emergency Service-ATEND	139
Accredited Technical Experts in Natural Disasters	
Western, Professor John	20
Dept Sociology, Univ Queensland St Lucia	127
Wettenhall, Dr Roger L	13
Head, School Admin Studies, Canberra CAE	20
White, Mr C M	78
Lec, School Economics, La Trobe Univ	
Wicking, Dr J	49
Lec, Dept Elect Eng, James Cook Univ	
Williams, Dr David	20
Materials Research Laboratories	

A-25	Page
Williams, Associate Professor MAJ School Earth Sciences, Macquarie Univ	81
Wooley, D J Head, School Eng, Ballarat CAE	6
Young, Mr I R Dept Civil-Systems Eng, James Cook Univ	50 55
Young Lawyers, Mr Kevin Andrews, Law Inst of Vic	149
Zillman, Dr J W Director, Bureau Meteorology, Melbourne	9 20

<u>INDEX OF CONTRIBUTING ORGANISATIONS</u>	A-26
	Page
Accredited Technical Experts in Natural Disasters (ATEND) Western Australian State Emergency Service	147
Australian National University PO Box 4, Canberra, ACT, 2600 (062) 495111	1
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La Trobe University Bundoora Vic 3083 (03) 4783122	77
Macquarie University North Ryde NSW, 2113 (02) 8888000	80

A-27	Page
Monash University Clayton Vic 3168 (03) 5410888	85
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Natural Disaster Action Committee (NDAC)	141
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	A-28
	Page
University of Adelaide GPO Box 498, Adelaide SA 5001 (08) 228 5333	105
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Western Australian Institute of Technology Hayman Road Bentley WA 6102 (09) 3507700	149
The Young Lawyers, Law Institute 470 Bourke Street Melbourne Vic 3000 (03) 6023922	149

INDEX OF DISASTER RELATED RESEARCH FIELDS

A-29

PAGE

BEREAVEMENT

Raphael, Professor Beverley 115

COASTAL CHANGE

Davies, Professor J L 80

Healy, Dr Terry 134

Hopley, Associate Professor D 49

Langton, Ms B 131

COASTAL ENGINEERING including Hydro-, Morpho-Dynamics

Blackman, Dr. D R 86

Chapman, Dr. David 131

Chapman, Professor Tom G 125

Foster, Associate Professor D N 125

Hinwood, Associate Professor John B 86

Melbourne, Professor W H 86

Sharp-Paul, Mr Alastair 95

Sobey, Dr R J 50

COMPUTER SIMULATION

Baker, Mr A S 51

Green, Dr David G 4

Harper, Mr B A 50

Sharp, Dr B B 113

Stark, Professor K P 45, 49

Walker, Associate Professor G R 45, 50

Watkins, Dr J R 100

Zillman, Dr J W 9, 20

CONSULTING

Beer, Dr Thomas 95

Bouwhuis, Ron 95

Carter, Air Vice-Marshal W 19, 140

Hargreaves, Ian 95

Jones, Mr Stuart 95

Sharp-Paul, Mr Alastair 95

Strachan, Mr David 95

INDEX OF DISASTER RELATED RESEARCH FIELDSPAGE

## CYCLONES including Cyclone Resistance

Allen, Dr G H	49
Baker, Mr A S	51
Bird, Dr T S	49
Bitmead, Dr R R	49
Blackman, Dr D R	86
Chamberlain, Professor Edna	127
Gibson-Wilde, Dr B C	48
Heron, Dr M L	48
Hopley, Associate Professor D	49
Lyons, Dr T	94
McDonald, Dr Neil S	5, 19
McKenzie, Mr R	48
Melbourne, Professor W H	86
O'Connor, Dr. Desmond	94
Oliver, Professor John	20, 42, 45
Sharp, Dr B B	113
Shipman, Mr A	49, 55
Sobey, Dr R J	50
Stark, Professor K F	45, 49
Stride, Mr H	49
Walker, Associate Professor G R	45, 50
Ward, Professor J F	45
Western, Professor John	20, 127
Wicking, Dr J	49
Young, Mr I R	50, 55

## DESERTIFICATION

Heathcote, Dr R L	13, 38
Schwerdtfeger, Professor Peter	40

## DESIGN IN RESCUE &amp; RELIEF

Popovic, Ms. Vesna	100
--------------------	-----

<u>INDEX OF DISASTER RELATED RESEARCH FIELDS</u>	A-31 <u>PAGE</u>
<b>DISASTER GENERAL</b>	
Accredited Technical Experts in Natural Disasters (ATEND)	147
Centre for Information and Research on Disasters and Natural Hazards (CIRDNH)	17, 19
Natural Disasters Action Committee (NDAC)	141
Murray, Mr Ian G	17
Nash, Dr A H	148, 149
Oliver, Professor John	20, 42, 45
Paul, Dr Dale C	103
<b>DISEASE</b>	
Curson, Dr P H	80
<b>DROUGHT</b>	
Chapman, Professor Tom G	125
Cordery, Associate Professor I	125
Heathcote, Dr R L	19, 38
Hobbs, Dr J E	19, 116
McDonald, Dr Neil S	5, 19
Tennakoon, M V A	38
<b>EARTHQUAKE including Monitoring, Resistance</b>	
Gibson, Mr Gary	97
Greenhalgh, Dr Stewart A	37
Parr, Dr Arnold R	108
Sharp, Dr B B	113
Smit, Mr R	37
Walker, Associate Professor G R	45, 50
Watkins, Dr J R	100
Wesson, Mr Vaughan	97

A-32

INDEX OF DISASTER RELATED RESEARCH FIELDS

PAGE

ECONOMIC EFFECTS & ASPECTS

Anderson, Mr J L	78
Butler, Mr J R G	130
Connel, J	111
Doessel, Mr D P	130
Jones, Professor E L	78
Lloyd, Professor A G	111
Milliken, Mr E P	32
White, Mr C M	78

EMERGENCY SERVICE

Arnold , Dr Trevor	139
--------------------	-----

ENVIRONMENTAL HAZARDS, STABILITY

Davey, Mr Colin	104
Peterson, Dr J A	20, 85

EROSION

Blong, Dr Russell	80
Mitchell, Mr P B	80
Riley, Dr S J	80
Smith, Dr D L	106
Twidale, Dr C R	106
Williams, Associate Professor M A J	81

EXPLOSION

Phillips, Dr H R	124
Piggin, Dr Stuart	135
Roxborough, Professor F F	124
Smythe, Professor Lloyd E	123

FAMINE

Currey, Dr Bruce	34
------------------	----

INDEX OF DISASTER RELATED RESEARCH FIELDSPAGEFIASCOS

Bennett, Professor John M	132
---------------------------	-----

FIRE including Hazards, Services

Anderson, Dr D	102
Barber, Assistant Chief Officer J R	22
Blong, Dr Russell	80
Campbell, Mr P A	101
Catchpole, Dr E A	102
Catchpole, Mrs W	102
Cheney, Mr N P	31
de Mestre, Dr N J	102
Gabric, Dr Albert	16
Garvey, Mr M F	23
Green, Dr David G	4
Kemp, Mr R	6
McKelvie, Mr Ian	16
Maynes, Mr K J	23
Morris, Ms Wendy	137
Nichols, Mr David	23
Packham, Mr David	16, 21
Parkes, Mr T	102
Peterson, Dr J A	20, 85
Pillans, Mrs A	49
Pratt, Mr B T	23
Ramsay, Dr G C	29
Riley, Dr S J	80
Ross, Dr Graeme	16
Sharp, Dr B B	113
Smythe, Professor Lloyd E	123

INDEX OF DISASTER RELATED RESEARCH FIELDSPAGEFLOOD, INC, FLOOD PLAIN, FLOOD DETENTION

Armstrong, Mr D	133
Bell, Dr F C	120
Black, Mr R G	99
Chamberlain, Professor Edna	127
Chapman, Professor Tom G	125
Codner, Dr G C	93
Ericksen, Dr Neil J	133
Frawley, Mr K	49
Graham, M	133
Greenaway, Mr. Mark	1
Handmer, Mr J W	5
Hirst, Dr M J S	105
Hobbs, Dr J E	19, 116
Howell, Associate Professor D T	125
Humphries, Dr. Robert B	1
Keller, Dr R J	93
Laurenson, Professor E M	93
McDonald, Dr Neil S	5, 19
Mein, Dr R G	93
Morris, Ms. Wendy	137
Peterson, Dr J A	20, 85
Phillips, Mr D I	103
Pilgrim, Associate Professor D H	125
Riley, Dr S J	80
Short, Ms Patricia	127
Smith, Mr David Ingle	1
Smith, Dr D L	106
Twidale, Dr C R	106
Volker, Dr R E	50
Western, Professor John	20, 127

INDEX OF DISASTER RELATED RESEARCH FIELDSPAGEFORENSIC ASPECTS

Brown, Dr Kenneth A	107
Hilton, Dr J M N	138
Landauer, Dr A A A	138
Pocock, Dr Derek Alan	138

FOREST PROTECTION

Parbery, Dr D G	112
-----------------	-----

GEOMECHANICS

Roxborough, Professor F F	124
---------------------------	-----

GEOMORPHOLOGY

Hargreaves, Mr Ian	95
Hopley, Associate Professor D	49

HUMAN RESPONSE

Britton, Mr Neil R	48, 55
Heathcote, Dr R L	19, 38
Kearney, Professor G E	45, 48
Landauer, Dr A A A	138
Reser, Dr J P	48
Short, Ms Patricia	127
Wettenhall, Dr Roger L	13, 20

HYDROLOGY see also FLOOD

Sharp, Dr B B	113
---------------	-----



INDEX OF DISASTER RELATED RESEARCH FIELDS PAGE

INSURANCE

Lester, Mr Les	19, 143
Lord, Mr R	145
Parr, Dr Arnold	108

LANDSLIP AND AVALANCHE

Crozier, Dr Michael	134
Dunbaven, Dr M	51
Eckersley, Mr J D	50, 55
Luscombe, Mr G	123
Mitchell, Mr P B	80
Murchie, H	104
Owens, Dr Ian,	134
Pain, Dr Colin F	123
Riley, Dr S J	80
Stevenson, Mr P C	104
Trollope, Professor D H	45, 49
Watkins, Dr J R	100
Williams, Associate Professor M A J	81

LEGAL ASPECTS

Andrews, Mr Kevin	149
Hunter, Ms, Lucy L	85
Epstein, Mr Judd A	85

LOW RISE BUILDINGS - NATURAL HAZARDS TO

Beresford, Mr F D	29
-------------------	----

INDEX OF DISASTER RELATED RESEARCH FIELDS

A-37

PAGE

MATHEMATICAL MODELLING

Anderson, Dr D	102
Catchpole, Dr E A	102
Catchpole, Mrs W	102
de Mestre, Dr. N J	102
Harper, Mr B A	50
Humphries, Dr. Robert B	1
Packham, Mr David	16, 21
Parkes, Mr T	102
Zillman, Dr J W	9, 20

METEOROLOGY

Bouwhuis, Mr Ron	95
Schwerdtfeger, Professor Peter	40
Zillman, Dr J W	9, 20

MINING

Dingsdag, Dr Donald	135
Horne, R	135
Phillips, Dr H R	124
Piggin, Dr. Stuart	135
Roxborough, Professor F F	124

NUCLEAR

Clarke, Dr. Magnus	33
Cousens, Mr. D R	41
Elkington, Dr. John S H	41
Lewis, Mr. R. A.	41
Myhra, Dr. S	41
Segall, Professor R L	41
Smart, Dr. R St. C	41
Turner, Dr. P S	41

INDEX OF DISASTER RELATED RESEARCH FIELDSPAGENURSING

McKinnon, Miss Margaret	98
-------------------------	----

OIL SPILLS

Beer, Dr. Thomas	95
Chapman, Professor Tom G	125
Humphries, Dr. Robert B	1

ORGANIZATIONAL RESPONSE

Parr, Dr. Arnold R	108
Wettenhall, Dr. Roger L	13,20

PERCEPTION OF HAZARD

Blong, Dr. Russell	80
Graham, M	133
Hobbs, Dr. J E	19,116
Stride, Mr H	49

PLANNING

Davey, Mr. Colin	104
Johnson, Mr. R K H	15
Morris, Ms. Wendy	137

POLLUTION INC. EFFECTS OF CHEMICAL AND WASTES APPLICATIONS

Douglas, Dr. L	110
Eberbach, Mr P	110
Fraser, Mr P	110
Guvanasen, Dr V	51
Hyde, Dr R	81
Linacre, Associate Professor E T	51
Potter, Professor O E	91
Riazi, Dr H	110
Steen, Mr W E	50,55
Volker, Dr R E	50
Watson, Dr I G	51

INDEX OF DISASTER RELATED RESEARCH FIELDS

A-39

PAGE

PREPAREDNESS AND PREVENTION

Agnew, Associate Professor J B	91
Cameron Fox, Mr Stan	103
Holder, Dr G A	91
Potter, Professor O E	91

PSYCHIATRIC ASPECTS

Raphael, Professor Beverley	115
Singh, Dr. B	115

PSYCHO-SOCIO-EFFECTS

Milliken, Mr. E P	32
Milne, Dr. Gordon	127
Price, Dr J	129

RELIGION

Piggin, Dr. Stuart	135
--------------------	-----

REMOTE SENSING

Allen, Dr. G H	49
Bird, Dr T S	49
Bitmead, Dr R R	49
McCloy, Mr. Keith R	96
Peterson, Dr J A	20,85
Sharp-Paul, Mr. Alastair	95
Shipman, Mr. A	49,55
Wicking, Dr J	49

RISK MAPPING

Barber, Assistant Chief Officer J R	22
Currey, Dr. Bruce	34
Morris, Ms. Wendy	137

<u>INDEX OF DISASTER RELATED RESEARCH FIELDS</u>	<u>PAGE</u>
<u>ROAD AND RAIL COMMUNICATIONS</u>	
Johansons, Dr. H A	101
<u>SALINITY</u>	
Butler, Mr W	38
<u>SEISMIC HAZARD</u>	
Barbour, R	133
Ericksen, Dr Neil J	133
Johnson, Mr. R K H	15
<u>SHIPPING</u>	
James, Dr M K	50
<u>SIMULATION EXERCISES</u>	
Tronc, Dr. Keith	94
<u>SOCIOLOGICAL ASPECTS</u>	
Parr, Dr Arnold R	108
Wettenhall, Dr Roger L	13, 20
<u>STORMS</u>	
Hobbs, Dr J E	19, 116
<u>STORM SURGE</u>	
Blackman, Dr. D R	86
Harper, Mr B A	50
Harvey, Dr N	49, 106
Hopley, Associate Professor D	49
Lennon, Professor G W	39
Melbourne, Professor W H	86
Stark, Professor K P	45, 49

INDEX OF DISASTER RELATED RESEARCH FIELDSPAGESTRUCTURES

Balint, P	122
Best, Mr R J	51
Black, Mr R G	99
Bourne, Mr S J	51
Boughton, Mr. G N	51,55
Buchanan, Mr R P	51
Button, Mr C R	99
Fraser, Dr D	122
Gonano, Mr D	50,55
Grundy, Associate Professor Paul	93
Heaney, Dr A	122
Kabaila, Associate Professor A P	122
Kneen, Dr P	122
Laurenson, Professor E M	93
Leicester, Dr R H	28
Melchers, Dr R E	92,93
Murray, Professor N W	87,93
Rangan, Dr B V	122
Reardon, Mr G F	51
Roy, Mr R	50,55
Sharp, Dr B B	113
Trollope, Professor D H	45,49
Walker, Associate Professor G R	45,50

TEPHRAS

Blong, Dr. Russell	80
--------------------	----

INDEX OF DISASTER RELATED RESEARCH FIELDSPAGETRAFFIC ACCIDENTS

Blunden, Professor W R	121
Burke Dr David C	77
Burley, Dr H T	77
Corner, Mr. J P	99
Fisher, Dr A J	121
Humphreys, Max	96
Munro, Mr R D	121
Tindall, Mr. J I	121

VETERINARY ASPECTS

Nairn, Professor M E	144
----------------------	-----

VOLCANIC HAZARD

Barbour, R	133
Blong, Dr Russell	80
Ericksen, Dr Neil J	133

WAVES

Colman, Mr E J	51
Mitchell, Mr G M	50
Young, Mr I R	50,55

WELFARE

Cameron Fox, Mr Stan	103
Chamberlain, Professor Edna	127
Chant, Ms Ngaire	146
Reid, Mrs Joan Innes	48

INDEX OF DISASTER RELATED RESEARCH FIELDS

A-43

PAGE

WIND

Bell, Dr F C	120
Best, Mr R J	51
Black, Mr R G	99
Blackman, Dr D R	86
Bourne, Mr S J	51
Boughton, Mr G N	51, 55
Holmes, Dr J D	50
Johnson, Mr R K H	15
Melbourne, Professor W H	86
Reardon, Mr G F	51
Roy Mr. R	50, 55
Steen, Mr W E	50, 55



1.

The Australian National University  
PO Box 4,  
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Centre for Resource and Environmental Studies (CRES)

\* Director: Professor Geoff Taylor (062 49 4588)

\* Robert B Humphries, Postdoctoral Fellow

Interests:

1. oil-spill trajectory simulation modelling
2. flood damage analysis

Research voids:

Dr Humphries sees a need for Australian oil spill research which is at present virtually non-existent; in particular the organizational aspects of oil-spill management.

Contacts:

Research contacts are made through visiting fellowships, international and interstate students, seminars, conference organization and attendance, collaborative research, sabbatical research, and submissions to enquiries.

\* Mr David Ingle Smith, Senior Fellow

Interests:

Mr Ingle Smith has been involved in urban flood damage studies for a number of years. His initial work was concerned with the Lismore and Richmond River Valley floods, and has prepared a set of five publications (booklets) on this work. Current work is dominantly concerned with flood hazard and it is hoped to produce a "Flood Damage Assessment" for Australia (funding permitting).

\* Mr Mark Greenaway, Research Assistant, has also been involved with flood damage analysis.

2.

Reports by D Ingle Smith (with others) relating to  
the Richmond River Floods.

363.34930994

Smith, D.I.

Munro, R.G., Jt.Auth

Richmond River Valley Flood Damages and Social

Attitudes: A Summary

1980

Canberra, A.N.U. for the Cttee.: 70P., ILL.,

Map, Bibliog.: Note: Summ. of Jt. Investig.

by Centre for Res. & Environ. Studies, A.N.U.,

Northern Rivers C.A.E.: Cres Report DIS/R2

1980 Flood Mitigation Investigation.

061514G

O 86740 001 3

Floods -- New South Wales -- Richmond Valley Flood

Damage -- New South Wales -- Richmond Valley

Flood Damage -- New South Wales -- Richmond Valley

Social Aspects

Flood damage -- New South Wales -- Richmond Valley

Attitudes

Smith, D.I.

Greenaway, M.A., Jt.Auth

Richmond River Inter-Departmental Committee

Computer Flood damage maps of Lismore 1980

Canberra, A.N.U. for the Cttee.: 32P., ILL.,

Col. Maps, Bibliog.: Note: For Northern Rivers

C.A.E. & Centre for Resource and Environmental

Studs. A.N.U.: Cres Report DIS/R3 (1980)

Flood Mitigation Investigation

061516L

Floods -- New South Wales-- Richmond Valley

Flood Damage -- New South Wales -- Richmond

Valley - Maps

Lismore (N.S.W.) -- Flood, 1974 -- Maps

Lismore (N.S.W.) -- Flood, 1974 -- Maps

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Handmer, J.W., JT.Auth.

Richmond River Inter-Departmental Committee

The effects of floods on health: Hospital

Admissions for Lismore

1980

Canberra, A.N.U. for the Cttee: 72P.. ILL..

Bibliog.: Note: By D.I.Smith, J.W. Handmer and

W.C. Martin: For North.Riv.C.A.E. & Centre for

Res & Envir. Studs. ANU.Cres Report DIS/R5 1980

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061515J

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3.

Lismore (N.S.W.) -- Statistics, Medical  
Lismore (N.S.W.) -- Flood, 1974

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Smith, D.I., and others

Richmond River Inter-Departmental Committee  
Flood Damage in the Richmond River Valley, New South  
Wales: An Assessment of Tangible and Intangible  
damages  
1979

Canberra, A.N.U. for the Inter-Departmental  
Committee: 307P., ILL., Maps: Note: A study by  
the Northern Rivers College of Adv. Education, &  
The Centre for Resource & Environment.Stud.,  
ANU Flood Mitigation Investigation

061120H                      0 86740 312 8  
Floods -- New South Wales -- Richmond Valley  
Flood Damage -- New South Wales -- Richmond

Smith, D.I., Munro R.G. & Others

Richmond River Inter-Departmental Committee  
The Social Attitudes of Lismore Residents to the  
Flood Problem  
1980

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- \* Dr David G Green  
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Research School of Pacific Studies (062) 492183 direct

General:

Dr Green's work in disaster studies relates to bushfire simulation using the special resources of computers and aerial photographs. Future research will relate to the validation, refinement, and application of the simulation model. There are no under-graduate course studies in disaster, nor are there any courses, seminars, etc at management level. Constraints affecting research are seen to be funding (for wind tunnel experiments etc.), and lack of detailed maps of fire spread patterns. There is collaboration with numerous other research groups and individuals working on bushfire behaviour, both in Australia and overseas. Professional contacts are:

- \* Dr A M Gill, Director, Ecology Section, CSIRO Division Plant Industry
- \* Dr I R Noble, Fellow, Environmental Biology, RSBS, ANU

Australian National University  
PO Box 4 Canberra ACT 2600

(062) 495111

- \* Dr N S McDonald  
Senior Lecturer  
Department of Geography  
Faculty of Arts

Dr McDonald's relevant experience includes undergraduate teaching in the fields of climatology and natural hazards. Over the last eight years, the Environment Hazards Course has covered the full range of hazards affecting Australia. Each hazard is examined according to its physical, social and planning aspects. Dr McDonald has been Project Leader of the Approved Australia Water Resources Research Project on "The Utility of Property Acquisition and Settlement Relocation in Flood Damage Reduction Programs". He is also Deputy Controller of the North Region ACT Emergency Services, and a corresponding member of Perception in the Environment which is a working group of the International Geographic Union.

He has supervised the following Honours and Post-Graduate students for the following hazard-related theses:

- |   |                 |                               |  |
|---|-----------------|-------------------------------|--|
| * | Livingstone I D | BA Hons 1975                  | "A Flood Loss Analysis of the August 1974 Flood at North Wagga Wagga, NSW"                         |
| * | Handmer J W     | BA Hons 1976                  | "The Lower Shoalhaven Flood Hazard"  |
| * | Irwin F A       | BA Hons 1979                  | "The Effectiveness of Darwin's Cyclone Warning System"   |
| * | McConnell G J   | M E S 1979                    | "Water Tables and Salting - Northern Victoria"   |
| * | Forbes B A      | MA 1980                       | "Flood Hazard in the Central Maitland Flood Plain, Lower Hunter Valley NSW"                        |
| * | Nayava J        | PhD to be submitted July 1980 | "The Climates of Nepal and their Implications for Agricultural Development"                        |
| * | Handmer J W     | PhD - ongoing                 | "The Utility of Property Acquisition and Settlement Relocation in Flood Damage Reduction Programs" |

6.  
Ballarat College of Advanced Education,  
Gear Avenue,  
Mount Helen, Victoria. 3350 (053) 301800.

\* D J Wooley, Head, School of Engineering.

This College's activities in counter-disaster are mainly confined to the conduct of a Graduate Diploma in Occupational Hazard Management, and to the organisation of a campus fire brigade unit co-ordinated by a lecturer in Business Studies, Mr R Kemp. Associated with the Graduate Diploma Course there are a large number of student projects and staff consultancy mainly in the areas of noise, atmospheric pollution and industrial injuries. The course outline for 1981 follows this description.

#### Session 1

Accident Phenomenology 1  
Risk Management 1  
Human Factors 1  
Law  
Statistics  
Risk Philosophy

#### Session 3

Occupational Health 1  
Risk Sociology and Psychology  
Risk Management 3  
Risk Engineering 2  
Human Factors 3  
Hygiene Engineering 1  
Management Studies 1

#### Section 2

Accident Phenomenology 2  
Risk Management 2  
Risk Engineering 1  
Human Factors 2  
Safety Law  
Statistics

#### Session 4

Occupational Health 2  
Risk Engineering 3  
Dissertation & Seminars  
Hygiene Engineering 2  
Management Studies 2  
Risk Sociology & Psychology

#### Unit Outlines:

##### Accident Phenomenology

1. Accident Causation - Time sequence and energy damage models, accident factors.
2. Countermeasures - Controllability, predictability.
3. Accident Investigation - Types of data, principles and practices.
4. Accident Epidemiology

##### Risk Philosophy

1. History of occupational hazard management.
2. Historical concepts - The fault doctrine.  
- Accident proneness.
3. The concept of risk - Definitions and dimensions.
4. Principles of risk analysis - Occurrence, consequence and probabilities.
5. Risk valuation - Objective and subjective measures of risk.

Ballarat CAE (contd)

#### Risk Sociology & Psychology

1. Risk Evaluation - Social, moral, ethical and political criteria, comparative criteria, examples of evaluations.
2. Risk Taking - Risk perception and benefit, motivation, risk taking behaviour and its modification, examples from road safety and industrial safety campaigns.
3. Sociology of risk-exposed groups.
  - Types of cultures
  - The structure of society
  - The socialisation process.

#### Risk Management

1. Principles of financial accounting in risk management.
2. System control of risk - national and corporate, institutional structures and the role of law.
3. Principles of risk management.
4. Risk groups, cost of risk, economic risk quantification and loss rates.
5. Risk evaluation by economic criteria - cost benefit concepts, the value of human life.
6. Financial risk control options
  - Insurable and uninsurable costs
  - Principles of insurance, self insurance, burning cost, franchise, excesses, evaluation of underwriters.
7. Corporate organisation for risk management
  - Objectives
  - Responsibility and accountability
  - Derivation and usage of risk data
  - Safety policies and committees
  - Safety in a non-ideal organisation.
8. Risk management systems
  - Management oversight and risk tree.
  - Management data systems.

#### Risk Engineering

1. Risk identification by analysis and synthesis.
2. Risk quantification - historical data and prognosis.
3. Engineering control and modification of risk
  - Evaluation of organisational and design strategies by case study
  - Organisation for risk control
  - Principles of risk modification and estimates of risk reduction.

8.

Ballarat CAE (contd)

4. Work procedure design (safe place and safe system)
  - principles of procedure analysis
  - machinery guarding
  - work permit systems.
5. Systems risk analysis and synthesis
  - Fault tree analysis
  - Failure mode and effect.
6. Principles of reliability engineering in the quantification of failure probability.
7. Low-frequency risks
  - Identification and quantification techniques



Bureau of Meteorology  
GPO Box 1289K Melbourne Victoria 3001 (03) 6620311

\* Dr J W Zillman  
Director of Meteorology

### General

The Bureau conducts research into the physical aspects of atmospheric phenomena including the physical description, modelling and the forecasting of these phenomena with relation to natural disasters, using computer resources. The Bureau of Meteorology does not conduct courses, seminars or workshops in disaster studies. It is the Australian focal point for the World Meteorological Organisation (WMO) and has contact with such bodies as the International Oceanographic Commission and the International Association of Meteorology and Atmospheric Physics. While most exchange is of a physical scientific nature, WMO has some involvement in aid to disaster-related projects in third world countries.

### Projects

The Application of GMS Data to Tropical Cyclone Prediction. Objectives - To develop techniques to support operational analysis of tropical cyclones in the Australian region and forecasting of their genesis, intensity, intensification, decay and movement using GMS visual imagery and enhanced infrared data; and to relate these satellite data to other observational data.

Application of Objective Forecasting Techniques to Tropical Cyclones. Objectives - To investigate and improve the application of objective techniques to the prediction of the behaviour of tropical cyclones in the Australian region, including the evaluation of those currently available and to estimate the error characteristics of each technique.

Tropical Cyclone Climatology. Objectives - To build up and maintain a comprehensive data bank suitable for the study of tropical cyclones in the Australian region and to undertake a range of synoptic climatologies relevant to tropical cyclone genesis, movement, intensity, intensification and decay.

Tropical Cyclone Severity Index. Objectives - To develop an objective aid in relating wind damage and tropical cyclone wind climatology for points in the Australian tropics.

Radar Studies of Tropical Cyclones. Objectives - To use radar data to investigate the physical structure and dynamics of tropical cyclones with emphasis on the development of both real-time and post-analysis assessment of movement and intensity.

10.

Flood Routing Investigations. Objectives - To develop improved techniques of flood routing for use in development and operation of flood forecasting systems.

Aros Sub-System 5 - Flood Forecasting. Objectives - To develop a system for the computer-based operation of a flood forecasting service and to demonstrate the operation of this system with application to the Victorian Regional Office requirements.

Peak Correlations for Flood Forecasting. Objectives - To revise and update currently used peak to peak river stage or flor correlations for flood forecasting in Victoria. Additionally, new relationships will be developed to supplement those already documented.

Severe Storms in Victoria: Detailed Studies. Objectives - To study in detail selected severe storms that cause loss of life and damage to property in Victoria. To undertake a mesoscale analysis as detailed as possible together with a broadscale analysis and determine features that may be useful for forecasting operations.

#### Publications List (Natural Disasters)

Bureau of Meteorology Publications in the Field of Natural Disasters. Reports published by the Bureau of Meteorology dealing with natural disasters are found in a number of sources. Both the Australian Meteorological Magazine and an internal series Meteorological Notes contain a selection of articles covering a wide range of disaster phenomena. (For instance, "An Observation of a Tornado in the Vicinity of Sth. Hedland on 17 December 1975" by R S Mauger and M R Ball in Meteorological Note No 99). Of a more technical nature are the Meteorological summaries. An example of these is the seasonally produced "Tropical Cyclones in the Northern Australian Regions" series. Alternatively, the Tropical Cyclone Data series deals with the entire Australian region in seasonal summaries, and is available from the 1962/63 period. A Bibliography of Tropical Cyclones A Training Note by G J Holland and I J Butterworth contains a comprehensive list of cyclone references, text-books and relevant seminars.

Periodically, a meteorological phenomenon is judged significant enough to necessitate a Special Report - those dealing with Natural Disasters are listed below:

Report by the Director of Meteorology on Cyclone Ada June 1970 Bureau of Meteorology. The Report concentrates on proposals for a more efficient cyclone detection and dissemination system. The improvement of public awareness concerning cyclones and warning systems is seen as essential and methods are suggested in the report. An examination of the circumstances surrounding the cyclone is provided, and the accuracy of the forecasts and warnings issued discussed.

Report by the Director of Meteorology on Cyclone Althea. July 1972. AGPS, Canberra 1972 (Special Report No 4) Bureau of Meteorology. The Report records the history of the cyclone and its impact on the community. A chapter is devoted to a discussion of the performance of the tropical cyclone warning system, and the response of both meteorological staff and the public in terms of disaster preparedness. The report evaluates criticism levelled against the warning communications system.

Report on Cyclone Tracy December 1974. Bureau of Meteorology. AGPS, Canberra 1977. (Special Report No. 7) The Report contains a comprehensive survey of the cyclone and its background incorporating a wide variety of data sources. Also included is a resume of cyclones in the Darwin area, a comparison with a similar past storm and an analysis of return period. The report discusses the behaviour of the cyclone, and examines the usefulness of new data and refined techniques for obtaining detailed measurements. The Appendices contain a detailed assessment of the performance of the tropical cyclone warning system.

Cyclone Joan December 1975. Bureau of Meteorology July 1979. The report documents the meteorological features of Cyclone Joan and outlines the operation of the Bureau's tropical cyclone warning system at the time. The tropical cyclone was the most destructive to affect the Port Hedland area in more than 30 years, and the report outlines the role played by satellites, weather watch radar, shipping and the synoptic network in detecting the cyclone and monitoring its movement.

Report on Googong Catchment Floods October 1976. Bureau of Meteorology. AGPS, Canberra 1977 (Special Report No 8). The Report concentrates on assessing the performance of flood forecasting and warning systems against the background of the Queanbeyan district floods. The operation of the flood forecasting system and the warnings and advices issued during the flood period are comprehensively detailed.

Report on Meteorological Aspects of the Catastrophic Bushfires in South-Eastern Tasmania on 7 February 1967. Bureau of Meteorology. Prepared by H G Bond, K MacKinnon and P F Noar. (Regional Office Tasmania). Issued by Director, Bureau of Meteorology Melbourne November 1967. The Report examines meteorological factors associated with the extreme fire danger situation of February 1967. The bushfire disaster is seen as the most severe in the State's history, and the report analyses the meteorological factors associated with the development of an extreme fire danger situation. Major sections deal in detail with the main synoptic features and with the fire weather parameters. The report comments on the difficulty of forecasting the characteristics of a fire danger day.

Final Report Woden Valley Storm 26 January 1971.

A comprehensive paper covering a study of past records of high intensity rainfall in the Canberra area and containing a detailed study of the characteristics of the storm. The report covers the meteorological situation prevailing prior to and during the storm, an analysis of all available rainfall and other meteorological data and a statistical study of the probability of such an event. The final chapter details the use of radar as a warning system.

Brisbane Floods January 1974. Report by Director of Meteorology. Bureau of Meteorology AGPS Canberra 1974. The report records both the meteorological situation at the time and the actual flooding, and examines the performance of the Brisbane Valley Flood Forecasting and Warning System during the flood. The report recognises the problems of dissemination and interpretation of warnings. The possibility of rectifying some deficiencies in the Bureau's flood warning system is discussed, although much of the public criticism levelled against the Bureau during the flood is refuted.

Storm of 22 March 1974, Portland-Fingal Municipalities, Tasmania October 1975. AGPS Canberra 1975. The Report documents the record storm rainfall and the subsequent severe local flooding and flood damage. Unusual meteorological aspects of the rainfall highlighted the difficulties of forecasting such a rare and localised occurrence; this is discussed together with the adequacy of the forecasts and warnings provided by the Bureau. Statistical aspects of the occurrence of such heavy rainfalls in the area are also presented.

Report on a Study of the Severe Thunderstorms over Sydney Metropolitan Area on 21 August 1971. Bureau of Meteorology. February 1973. V J Bahr R L Kemp D Kurzeme. A comparison of the storm is made with a severe thunderstorm model described by various researchers. A selection of Press Reports precedes discussions of the development and evolution of the storm. The report comments on the probability of the storm and the difficulty of forecasting such a highly localised event.

Tropical Cyclones in the Australian Region 1909-1975. Bureau of Meteorology R S Lourensz. A comprehensive and critical appraisal of all available tropical cyclone data for the 66 year period. The Report is primarily a technical summary of cyclone data including material on tropical cyclone tracks, frequency distributions of minimum central pressures, and speed and direction roses depicting cyclone movement. Other figures include decadal incidence of cyclones in the Australian region as a function of month, and total incidence presented biennially.

Canberra College of Advanced Education,  
PO Box 1,  
Belconnen, ACT 2616

13.

(062) 522111

\* Dr R L Wettenhall, Head of School, Administrative Studies

General:

Dr Wettenhall has been involved with research into the social and especially the administrative consequences of natural disaster, extending to a concern for the capacity of Governments and organizations generally to respond to sudden and major crisis events. In early work he was involved with Professor John Power, now Professor of Politics at Melbourne University. In more recent work he has been involved with the members of the working party on the interdisciplinary study of natural disasters which met at the Canberra College of Advanced Education in September 1977 under the co-chairmanship of himself and Dr Les Heathcote, Reader in Geography at Flinders University of South Australia. This party has concentrated mainly, but not very successfully, on lobbying for the encouragement and better organization of multi-disciplinary and multi-institutional disaster research and actual disaster administration.

The School of Administrative Studies does not conduct disaster studies either at under-graduate or post-graduate level; nor are there seminars and workshops in these matters. The fact that Dr Wettenhall's responsibilities involve some teaching and much administration leaves him little time either to conduct research himself or to organize research teams. However it is his ambition to contrast the administrative response-patterns in the four Australian cities which have suffered significant natural disasters over the last 15 years (Hobart, Townsville, Brisbane, Darwin) with a view to drawing lessons about strengths and weaknesses. He believes that a similar comparative study of small communities which have suffered disaster, like Meckering in Western Australia and Killaney in Queensland, would be useful. Amongst other things, such studies would highlight the role of "emergent groups" in disaster.

Dr Wettenhall is closely associated with Professor E Quarantelli of the Disaster Research Center at Ohio State University, and with some other members of the Disaster Research Committee which convened at the 1978 World Sociology Congress.

14. Disaster Studies, Reports, etc. by R L Wettenhall
  1. "Bush Fire Disaster: Some Social Issues." In Aust. Assn. of Social Workers, Social Issues of Today, Eleventh National Conference Proceedings, Sydney, 1970, 15-32.
  2. "Bureaucracy and Disaster I : Prelude to the 1967 Tasmanian Bushfires." Public Admin. (Sydney), 1969, 28(4), 263-277. (With J M Power.)
  3. "Bureaucracy and Disaster II : Response to the 1967 Tasmanian Bushfires." Public Admin. (Sydney), 1970, 29(2), 165-188. (With J M Power).
  4. Bushfire Disaster: An Australian Community in Crisis. Sydney: Angus and Robertson, 1975 (1-320, xviii).
  5. "Natural Disasters in Human Settlements: An Australian View on Administrative Responses." In Aust. Government Habitat Task Force, National Report to Habitat, the United Nations Conference on Human Settlements, Canberra, AGPS, 1976, 213-222.
  6. "Natural Disaster: Australia's Summer Fate." Current Affairs Bulletin, 1976, 52 (11), 4-12.
  7. "Disaster and Social Science in Australia". Disasters (Pergamon, London), 2(4), 1978, 241-245.  
(This was a slightly adapted version of the paper "Sociology of Disaster : Australian Report," which was presented to the World Congress of Sociology, Uppsala, Sweden, in August 1978 and subsequently published in its original form in SIFKU-Informationen (Kiel, West Germany), 2(3), 1979, 69-77.)
  8. "Sociology of Disaster : A Report on Discussions at Ninth World Congress of Sociology, Uppsala, Sweden," Beyond Impact (CIRDNH, Caulfield), No. 1, December)1979, 1-3.
  9. "Organisation and Disaster : the 1967 Bushfires in Southern Tasmania", in L Heathcote and B Thom (editors), Natural Hazards in Australia, Canberra, Australian Academy of Science, 1979, 431-435.
  10. "The Response of Government to Disasters : A Study in Fragmentation" in John Oliver (editor), Response to Disaster, Townsville, Centre for Disaster Studies, James Cook University of North Queensland, 1980, 261-295.

Canberra College of Advanced Education  
PO Box 1, Belconnen, ACT 2616

15.  
(062) 522111

- \* Mr R K H Johnson, Head of the School of Enironmental Design

Mr Johnson has submitted the following brief notes for inclusion in this Directory :

- 1) Study of wind behaviour around buildings through the use of models, and structural studies for the control of wind forces and seismic disturbance are conducted as part of the under-graduate courses in Architecture and Building.
- 2) Appropriate land-use based on ecological, hydrological, and other considerations is a study area for the post-graduate courses in Urban and Regional Planning.

16.

Chisholm Institute of Technology (CIT)  
PO Box 197,  
900 Dandenong Road  
CAULFIELD EAST VIC 3145 (03) 5732222

- \* Mr David Packham (03) 5732006 direct

Water Studies Centre & Centre for Applied  
Mathematical Modelling (the water studies centre is  
an offshoot of the Department of Chemistry, and the  
Centre of Applied Mathematical Modelling stems from  
the Department of Mathematics).

Mr Packham is involved with the Fire Research Group  
in the modelling of bushfire spread. This Group is  
subcontracting to CSIRO for the development of a  
model to describe the extinguishment of forest fires  
by aerial attack (water bombing - Project Aquarius  
q.v.). Also included in the Group are:

- \* Dr Graeme Ross, Head, Department of Mathematics
- \* Dr Albert Gabric, Lecturer, Department of Mathematics
- \* Mr Ian McKelvie, Tutor, Department of Chemistry

Of the five people involved in Fire Research, three  
are full-time. Mr McKelvie devotes most of his time to  
the Fire Research Group and spends about a quarter of  
his time in the Chemistry Department. The Group  
maintains constant contact with the CSIRO Division of  
Forest Research in Canberra (q.v.), and the Country  
Fire Authority of Victoria (q.v.). Also it maintains  
international links with the United States Fire Service  
where Dr Ross has worked recently while on sabbatical  
leave. Special resources being used with Project  
Aquarius include laboratory and pilot plant scale  
natural fuel fires. Information (data) from  
controlled "burns" (forest fires) in Western Australia  
has yielded a report:

"Mathematical Smoke Dispersion Model - Prescribed  
Burns".

Camm Report No. 1 September 1980 CIT

see also Ross & Packham 74th International Symposium  
on Air Pollution Philadelphia July 1981.



Chisholm Institute of Technology (CIT)  
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900 Dandenong Road,  
Caulfield East Vic 3145

(03) 5732222

17.

Centre for Information and Research on Disasters and  
Natural Hazards (CIRDNH) (03) 5732477

\* Mr Ian G Murray,  
CIRDNH Co-ordinator and Lecturer in Welfare Studies

As co-ordinator of CIRDNH, Mr Murray has very general  
interests in matters of disasters and natural hazards.  
His disaster-related activities include:

1. information collation and dissemination
2. state-of-the-art study of disaster warning systems.

There are no courses or sections of courses of instruction on  
disaster-related matters at present, although some courses in  
the past in Communication Organisation have included emphasis  
on disasters. Also there are no graduates or others aspiring  
to higher degrees working on disaster-related projects.

A significant achievement was the setting up of the Centre  
for Information and Research on Disasters and Natural Hazards  
in 1979, and a list of members of the Centre's Advisory Com-  
mittee is at the end of this description. Reports and  
working papers associated with CIRDNH are available on  
request. A paper entitled:

"Social and Political Aspects of Disaster Warnings"

was presented by Mr Murray to the seminar "Response to  
Disaster" which was held at James Cook University, Townsville  
on 16-18 July 1979. Research constraints at the CIT relating  
to disasters and hazards stem mainly from lack of resources;  
funding and personnel in particular. No funding is available  
through CIT itself for such research, and apart from Mr  
Murray, personnel who maintain an interest in this area are  
also lacking. Administrative support and encouragement, as  
well as some seeding finance, has come from CIT, but attempts  
to attract outside professionals or to encourage interest in  
those already at CIT have been disappointing.

Worthwhile future disaster-oriented projects could include  
short courses at TAFE level with appeal to the general public,  
as well as some specialists, in areas such as journalism,  
welfare administration etc. Mr Murray is also the Vice-  
President of the Natural Disasters Action Committee (qv),  
a national body representing the views of disaster victims.  
Gaps in disaster research are identified as follows:

18.

1. Sociologically oriented research. Much of the research in the human behavioural aspects of disasters is oriented towards geographical and psychological disciplines.
2. Organizational aspects and 'disaster administration'. How organizations actually respond to disaster at all time phases (prevention - threat - impact - recovery) within the Australian setting. Communication strategies for organizations and communities in disaster situations.
3. How best to operationalise among front-line personnel the results of research already completed.
4. Political and legal aspects, including the effect of politics at the local level upon mitigation, adjustment and recovery.
5. Ideological and psychological factors affecting those working in the field, either in the front-line or in higher administrative positions, and including academic researchers.
6. More specifically, the effect of excitement and sensationalism on workers, researchers, observers, (such as the media), and potential victims.
7. Action-oriented research - i.e. research which incorporates in its methodology feedback to potential users of the research findings.

An example of the above is the project to examine the range of adjustments to a variety of natural hazards, and the reasons for choices of adjustments among a sample of cities and towns in Australia. The project was proposed in conjunction with similar projects in 3 other countries in 1978, but plans were abandoned when the 'parent' U.S. research project was refused funding.

Advisory Committee,  
Centre for Information and Research on  
Disasters and Natural Hazards (CIRDNH) (03) 5732477

Chisholm Institute of Technology,  
PO Box 197,  
Caulfield East. Vic 3145

(The following is a list of names and addresses of  
Advisory Committee Members)

Major-General T Cape  
Australian Red Cross Society  
Hobart Place  
Canberra. ACT 2600 (062) 478675

Air Vice-Marshal W Carter  
"Blue Range"  
Macedon Vic 3440 (054) 261611

Mrs Ruth Dalitz  
Hon Secretary  
Natural Disasters Action Committee  
21 Ponds Drive  
Lara Vic 3212 (052) 821648

Prof John Dillon  
Faculty of Economic Studies  
University of New England  
Armidale NSW 2351 (067) 722911

Brig Ian Gilmore  
Director  
Australian Counter Disaster College  
Macedon Vic 3440 (054) 261205

Dr L Heathcote  
School of Social Sciences  
Flinders University  
Bedford Park SA (08) 2753911

Dr J Hobbs  
Dept of Geography  
University of New England  
Armidale NSW 2351 (067) 732903

Mr Les Lester  
Insurance Council of Australia  
31 Queen Street  
Melbourne Vic 3000 (03) 6141077

Dr Neil McDonald  
Geography Department  
Australian National University  
ACT 2600 (062) 495111

20. CIRDNH (contd)

The Director, Mr R J Aitken  
State Emergency Services of Victoria  
31 Queens Road  
Melbourne. Vic. 3004 (03) 2674688

Mr Ken Jarvis  
NSW Department of Youth and Community Services  
Central Square, 323 Castlereagh Street  
Sydney NSW 2000 (02) 2177100

Prof J Oliver  
Department of Geography  
James Cook University  
Townsville Qld 4811

Dr J Peterson  
Department of Geography  
Monash University  
Clayton Vic 3168 (03) 5410811

Senior Research Scientist, Dr G Pickup  
Wildlife & Range Lands Research, CSIRO  
Hartley Street  
Alice Springs NT 5750 (089) 524255

Dr S Tan  
St Vincent's Hospital  
Victoria Parade  
Fitzroy Vic 3065 (03) 4182211

Prof J Western  
Department of Anthropology and Sociology  
University of Queensland  
St Lucia Qld 4067 (07) 3771111

Dr R Wettenhall  
School of Administrative Studies  
Canberra College of Advanced Education  
PO Box 1  
Belconnen ACT 2616 (062) 522111

Dr David Williams  
Radiation Physics Group  
Materials Research Laboratory, PO Box 50,  
Ascot Vale Vic 3032 (03) 317222 ex 728

Dr J Zillman  
Director  
Commonwealth Bureau of Meteorology  
150 Lonsdale Street  
Melbourne 3000 (03) 6620311

Mr Ross Parkhowell  
Department of Community Welfare, Regional Services  
55 Swanston Street  
Melbourne 3000 (03) 6536522

Dr T Keulemans                      CIRDNH (contd)                      21.  
Acting Dean, School of Social and Behavioural Studies  
Chisholm Institute of Technology  
PO Box 197  
Caulfield East Vic 3145 (03) 5732222

Mr Ian G Murray  
CIRDNH Co-ordinator and Lecturer in Welfare Studies  
Centre for Information and Research on Disasters and  
Natural Hazards  
Chisholm Institute of Technology  
PO Box 197  
Caulfield East Vic 3145 (03) 5732477 direct

Dr M Ronan  
Head, Department of Applied Sociology  
Chisholm Institute of Technology  
PO Box 197  
Caulfield East Vic 3145 (03) 5732222

Mr D Packham  
Department of Chemistry  
Chisholm Institute of Technology  
PO Box 197  
Caulfield East Vic 3145 (03) 5732222

Mr Malcolm H Mathias  
16 Anthony Street  
Ormond Vic 3204 (03) 5782376

22.

Country Fire Authority - Victoria  
Fire Research Unit,  
1291 Malvern Rd.,  
Malvern Victoria 3144

(03) 20 2571

\* Assistant Chief Officer J R (Jim) Barber

General:

Fire research should be considered as an important component of the overall task being undertaken by the Country Fire Authority in its duty of "taking, superintending and enforcing all necessary steps for the prevention and suppression of fires and for the protection of life and property in case of fire ..." within the country area of Victoria.\*\*

The aim of the Research Unit is to carry out research into significant aspects of fire prevention, suppression and protection in both urban and rural risks so that more effective methods may be developed.

In establishing the Research Unit in 1979 the Country Fire Authority set out the following objectives:

1. To undertake research projects as required by the Chief Officer and the Authority.
2. To develop more effective rural and urban fire prevention by investigating:
  - \* Causes of fires and the means of reducing their occurrence;
  - \* Means of reducing severity and rate of spread of fires;
  - \* The methods for classifying fire risk areas and fire hazards for land development;
  - \* Effectiveness of current fire prevention planning and techniques.
3. To develop more effective fire suppression by research into:
  - \* Effectiveness of current fire suppression strategies and tactics;
  - \* Fire behaviour in both rural and urban situations in respect to
    - Meteorological influences
    - Fuel types and quantities (fire load) and

\*\* Country Fire Authority Act (1958) Section 20

## Country Fire Authority - Victoria (continued)

fuel moisture content

## - Topography

- \* Effectiveness of the use of water and other extinguishing agents.
- 4. To carry out research into other hazards relevant to improved fire prevention, suppression and protection.
- 5. To disseminate findings as notes and articles for distribution within the fire services, as published research reports, through the presentation of papers at conferences and seminars or by participation in training programmes.
- 6. To liaise with and supplement the work of other research and allied organisations and to participate in joint projects and the exchange of information for mutual benefit in fire research.

## Research Staff:

Officer in Charge - Assistant Chief Officer, J.R. Barber,  
M. Env. Sc., DDA, M.I. Fire E., MAIAS.

- \* Regional Officer K.J. Maynes, B.Sc. (Ed), B.Ed.
- \* Research Officer in Training M.F. Garvey, B.Sc.  
(seconded July 1982)
- \* Scientific Officer B.T. Pratt, M.Sc. (Edin.), B.Sc.Hons  
(Melb.), ARACI, G.I.Fire E., resigned December 1981.
- \* Temporary staff are employed part-time for specific tasks  
- e.g. Mr. David Nichols, M.Sc., Remote Sensing and  
Grassland studies. Graduate university students; field  
sampling and laboratory duties.

## Facilities :

The laboratory is equipped to enable small scale testing, photographic work and the preparation of reports. A range of photographic, recording, meteorological and sampling equipment is carried in the Unit's two station wagons which are each fitted with VHF transceivers.

24.

Country Fire Authority - Victoria (continued)

Programme of Research :

A programme of research has been adopted that will enable the study of a range of long term projects associated with rural, urban and industrial fire hazards. Investigations are made of potential fire causes that are of particular concern. Officers of the Unit attend significant urban and rural fires, either to prepare reports on the specific incidents or to collect data for other projects. In addition, technical advice and assistance is given to other Sections of the Authority, e.g. equipment testing at Training Wing, Protective Equipment Section, Publicity.

Considerable emphasis is placed on co-operation with other research organisations to enable economy of operation, to avoid duplication of effort and facilities and to achieve an interchange of information. Joint research or liaison is being undertaken with the CSIRO Divisions of Building Research, Forest Research and Textile Physics; Town and Country Planning Board\*; Department of Agriculture; Melbourne and Monash Universities; Chisholm and Swinburne Institutes of Technology; several interdepartmental committees and IBM (Australia) Ltd. Valuable assistance is provided by land owners and members of the volunteer fire service.

Fire research is a multidisciplinary task requiring the co-ordination of a wide range of expertise and resources as well as an understanding of the needs of the fire service. The Research Unit is of greatest value to the Authority when providing an interface between pure research and the field requirements, i.e. in applied research.

Information on research programmes is being disseminated through publications such as the Operations Supplement of "The Fireman", by presentation of papers at conferences and seminars and the preparation of training notes.

Research Projects (1979-82):

1. The Study of Flammability of Grassland Fuels
  2. Monitoring by Remote Sensing (field surveys, aerial photography, Landsat satellite imagery)
  3. Division of the State for Days of Total Fire Ban
- \* Now the Victorian State Government Department of Planning (q.v.)



## Country Fire Authority - Victoria (continued)

4. Fire Hazard Mapping (see also the entry under Victorian State Government Department of Planning for joint project with the Country Fire Authority).
5. Design and Siting Guidelines - Bushfire Protection for Rural Houses.
6. Bushfire Protection in Rural Areas and Small Towns - A Planning Guide.
7. Firefighters' Clothing and Heat Protection.
8. Roadside Fire Break Construction.
9. Agricultural Equipment ( as possible fire hazard)
10. Knapsack Sprays and pressurised Water Extinguishers
11. Fire Hazard of Safety Matches.
12. Building Fire Investigation.
13. Plastics.
14. Hazardous Materials.
15. LPG.
16. Certificate of Fire Technology (conducted at Swinburne Technical College).
17. Aerial Dropping of Water and Retardant (1982). The Research Unit is also associated with the CSIRO Project Aquarius - see entry under CSIRO Division of Forest Research.
18. Land Use Recommendations, Planning Schemes, Interim Development Orders.
19. Case Studies of Selected Fires and Incidents.
20. Minor Projects and Enquiries.

RESEARCH PAPERS AND REPORTS

Research Papers Published

Rasbash, D.J. & Pratt, B.T. "Estimation of the Smoke Produced in Fires", Fire Safety Journal, Vol. 2, No. January 1980.

Barber, J.R. & Pratt, B.T. "Research into the Flammability of Grassland in Australia", Fire International, No. 69, December 1980.

CFA Research Unit. Hazchem Training Notes.

CFA Research Unit. UN Numbers Reference List.

Barber, J.R. & Morris, W. Design and Siting Guidelines - Bushfire Protection for Rural Houses; also published in Operations, Nos. 98 & 99, November and December 1980.

Barber, J.R. & Morris W. Fire Hazard Mapping; also published in Operations, No. 96, September 1980.

McCutchan, J. & Pratt, B.T. "Electric Fences - A Fire Hazard?", Operations, No. 89, February 1980.

Pratt, B.T. "Towards Hazchem", Operations, No. 82, July 1979.

Maynes, K.J. "Knapsack Maintenance", Operations, No. 110, November 1981.

Barber, J.R. & Pratt, B.T. "The Flammability of Grasslands", Operations, No. 93, June 1980.

Pratt, B.T. "Identification of Hazardous Chemicals", Emergency Vol. 3 No. 5, September/October 1981.

Barber, J.R. "Fire Brigades" Approach to Fire Prevention: Two Case Studies", Victoria's Resources, Vol. 19, No. 3, September 1977.

Barber, J.R. "The Development and Implementation of Strategic Fire Breaks", Operations, No. 97, October 1980.

Barber, J.R. "Fire Prevention as an Essential Factor in Roadside Management", Victoria's Resources, Vol. 19, No. 2, June 1977.

## Country Fire Authority - Victoria (continued)

Project Reports

Grape Dehydrators (2.10.80)

Recirculating Batch Grain Driers (30.1.82)

Fire Danger of Safety Matches (1.7.81)

Application of Water Sprays to Building Fires (27.7.81)

Choice of Foams to be used on Liquid Fuel and Chlorine Spills (3.8.81)

Risk of Ignition of Grasses by Subaru Vehicle Exhausts (1.10.81)

Gas Operated Scatter Guns (21.9.81)

An Investigation into the Suitability of Selected Appliances as Alternatives to Knapsacks in Respect of Section 50 of the Country Fire Authority Act 1958 (12.2.82)

Report of Tests - The Accuracy of Available Hand-Held Wind Gauges (28.6.82)

Study Tour of Fire Research Organisations and Fire Departments in North America and Canada, June 14 to August 10, 1981 (5.3.82)

Division of Victoria for Total Fire Bans (3.2.82)

Fire Prevention - Mt. Martha (11.12.81)

Preliminary Report on Evaluation of Bullthrush Aircraft for Water/Retardant Drops on Grassland Wild Fires (23.4.82)

28.

CSIRO Division of Building Research,  
Graham Rd, HIGGETT VIC 3190

(03) 5550333

General:

The CSIRO Division of Building Research is divided into the following sections:

- \* Architectural Physics
- \* Built Environment
- \* Planning and Management
- \* Environmental Hazards
- \* Structures
- \* Performance of Building Materials
- \* Supradisciplinary Groups

The sections relating to disaster mitigation are Structures and Environmental Hazards.

Structures :

- \* Head of Section : Dr R H (Bob) Leicester

Aim of Section :

To obtain practical information on the performance of building structures, and to promote the application of this information.

Research Facilities :

A large test laboratory which enables  $\frac{1}{4}$  scale models of high rise structures to be subjected to a variety of forces and stresses to simulate gas explosions in such structures, winds, and earthquake stresses. The test structure is built on a rigid 0.6 metre thick concrete floor of the laboratory, and loading forces are applied through the floor from the basement. Other tests on models include programmable vibrational tests in various vibrational modes, by means of a hydraulic shaker. The laboratory contains a model of the Port Hedland Port Authority Building which looks something like an air traffic control tower. It has been subject to vibrational tests. Vibrational tests are important to assess the security of buildings eg., the new CSIRO animal health laboratory which will probably contain specimens of potentially dangerous viruses etc. In another laboratory work is being done on strengths of frames and cladding with respect to racking forces (cf JCUNQ Cyclone Station). There is a  $\frac{1}{4}$  scale village (low-rise structures) situated on open ground at Carrum whose units are intermovable.

This is used to check general theory on wind forces.

Other research facilities being used include a wind tunnel, and computer simulation models for predicting wind damage to buildings; this effort is related to the Insurance Industry. In the past, wind effects on buildings have been studied for design codes and insurance purposes. Some work has been done on cyclone resistant buildings in conjunction with the Experimental Building Station at Sydney (this is part of the Department of Housing and Construction), but this has suffered reduced activity because of reduced funding. A set of colour slides is available from the Structures Section at a cost of approximately \$35 which shows wind damage to buildings at different wind speeds.

\* Natural Hazards: F D (Don) Beresford

The aim of this activity is to make risk assessments through field investigations and to provide recommendations for good building practice that will minimize damage to domestic and other low-rise buildings, and to obtain information on the loads induced by the wind on structural elements of low-rise buildings.

Extensive real and potential damage can be caused to low-rise buildings in Australia by winds, floods, earthquakes, and bushfires. Because low-rise buildings are traditionally non-engineered and because their mode of construction falls outside the scope of structural engineering, field investigations of damage are essential for determining the deficiencies and associated risks in these buildings. Flood-resistant building activities are now dormant because of lack of funds.

\* Environmental Hazard

Head of Section : Dr G C (Caird) Ramsay

The disaster related aspects of this section's work include

- \* surveys of building fires
- \* combustion characteristics tests of plastics materials
- \* fire hazards of furnishings particularly with reference to plastics content which can produce toxic combustion products
- \* fire performance of wall linings and plastics cladding
- \* fire performance of sandwich panels
- \* visibility through smoke (to be commenced)

30.

Much of the work is related to plastics because these materials are now used widely in building and furnishings. Certain plastics can burn with the evolution of much smoke, toxic gases, and obnoxious gases eg., burning PVC will produce hydrochloric acid fumes.

\*\*\*\*\*

The Division receives thirty to forty thousand requests for information each year, mostly from private individuals. These used to be attended to but because of monetary restrictions only corporate requests are now accepted. The Built Environment Section, which is not involved with hazards or disasters as such, aims at achieving a built environment that fulfils community expectations by studying aspects of the ways in which people use the built environment, the effects it, in turn, has on their lives, and the processes through which society shapes its built environment. This section is mentioned herein because it has a number of psychologists and social scientists on its staff; an unexpected feature of what would appear to be an Engineering Division.

The former Supradisciplinary Groups were composed of various convened staff members to study the following:

- \* technological forecasting (relating to the building industry)
- \* urban pollution and the built environment
- \* terotechnology i.e., optimum use technology, with relation to buildings
- \* local government, to coordinate research of interest to local government
- \* uncertainty and decision-making in the construction sector

These Supra disciplinary Groups have been largely superseded by four multi disciplinary Programmes as follows :

- (a) Safety and Risk (Structural safety, fires)
- (b) Durability
- (c) Shelter and Infrastructure (Planning, Sociological aspects)
- (d) Life Cycle Performance (Productivity of the building industry).

Existing projects will be carried out as part of the above four programmes, and previous programme designations (e.g. "Environmental hazards") will disappear.

CSIRO Division of Forest Research  
Banks St  
Yarralumla ACT 2600

31.

(062) 81 8211

Mr N P (Phil) Cheney

General:

- \* Mr Cheney is involved in empirical, rather than fundamental, field studies of fire behaviour. He has also been involved with the production of burning guides and fire danger rating systems, and has interests in fire behaviour and fire ecology (changes to the environment resulting from fires).

Project Aquarius

The Division of Forest Research is taking part in Project Aquarius in co-operation with State forestry and fire control agencies. The aim is to compare the cost effectiveness of large air tankers with that of conventional bushfire suppression techniques in Australia. Before field trials with an air tanker can be carried out, it is necessary to understand the behaviour of the kinds of fires against which air tankers are likely to be used. Aspects to be studied will include the development of fires in summer and the process of "spotting", where firebrands are blown downwind to start new fires ahead of the main fire. Equipment has been tested and calibrated throughout 1982 and the fire behaviour studies will be conducted in Western Australia from January to March 1983. Associated studies will measure the work output of and the physiological stresses on, fire fighters engaged on hand line construction. Trials planned for Victoria in the summer of 1983-84 will use a large tanker, of a kind commonly used in North America, to determine its effectiveness under local conditions. Trials will include various types of fire retardants, and water. Chisholm Institute of Technology in Melbourne will construct mathematical models incorporating fire behaviour, aircraft and retardant performance, and conventional fire fighting practices so that results can be extended to other aircraft and other forest fuel types. Economic studies will determine the cost-effectiveness of all the fire protection options studied. The findings of Project Aquarius will allow fire control agencies to make soundly based decisions when selecting the most suitable fire protection systems for Australia's forests and rural areas.

32.

Darwin Community College,  
PO Box 38221,  
Winnellie, Northern Territory. 5789 (089) 844277

\* Mr E P (Ted) Milliken,  
Senior Lecturer,  
Department of Humanities & Social Sciences

The following disaster-related research has been undertaken:

1. psychological, sociological, and economic effects of rehousing Darwin people after cyclone Tracy.
2. effect of cyclone Max on people who had experienced cyclone Tracy (small study).

The present survey began in January 1981, and information from over six hundred respondents is undergoing analysis by computer. Future research will probably be an extension of the cyclone Max study. The current study is being funded by the Australian Housing Research Council. There are no courses in disaster studies being conducted at the College.



Deakin University  
Victoria 3217

(052) 47 1111

\* Dr Magnus Clarke  
Lecturer  
School of Social Sciences

General:

Dr Clarke's interests lie in aspects of the social and physical effects of nuclear attack; namely disaster trauma, warning procedures, preparedness, prevention, and social welfare. There are no courses, workshops or seminars relating to these matters either at under-graduate or post-graduate level, but a course on Australian Defence and Strategic Studies is to be proposed and will contain aspects of disaster studies. At this time there are no graduates aspiring to higher degrees at Deakin University in nuclear war studies. Dr Clarke has published a book entitled:

The Nuclear Destruction of Britain  
Croom Helm, London, 1982.

He expects to undertake a similar study on the Australian nuclear war position, beginning 1983.

34. Flinders University of South Australia  
Sturt Road  
BEDFORD PARK SA 5042 (08) 2753911

\* Dr Bruce Currey Ph. D., M.P.H.  
Research Fellow  
Food Crisis Management Group  
School of Social Sciences

General:

Research is being carried out in the areas of:

- 1) disaster risk vulnerability mapping, and
- 2) famine warning systems.

Work is being carried out with Dr R L Heathcote, Reader in Geography (q.v.). Under graduate courses are being conducted in Famine Studies for some eighty students per year, but there are no such courses for management personnel, although there is a proposal for a course in Food Crisis Management Training. Dr Currey has been involved in lecturing for USAID with Air Vice Marshal W Carter (formerly Director of the Australian Counter Disaster College at Mount Macedon, Victoria q.v.). As well as having international links he has been involved in consultancies in Bangladesh and Indonesia. It is envisaged that future research will be related to comparative food crisis management in Uganda and Bangladesh. He identifies constraints affecting research as funding, and a shortage of high calibre graduate students.

Publications and Papers are indicated in the following Annex.

Dr Bruce Currey (contd)

Publications:

1981: Famine Forecasting: Fourteen Fallacies, Ceres FAO Review of Development, March Issue

1981: "Geography and Famine". Paper read at Royal Geographical Society of Australasia, AGM, Adelaide.

1981: Food Crisis Risk Mapping. Paper read at Indonesian Disaster Preparedness Conference, Bogor, March

1980: "Bad News : Is It True", Science. Vol. 210, No. 4476, pp 1301-1302

1980: Famine Sleuthing in East West Perspectives, Vol. 1, No. 3. The East West Center, Honolulu pp 6 - 10.

1980: Famines in the Pacific: Losing the Chances for Change. Geojournal, Vol. 4, No. 5, pp 447-466

1980: Climate and Famine. Paper read at National Center for Atmospheric Research, Boulder, Colorado, June.

1980: A Simple Guide to a Computerized Bibliographic Reviewal System. Editor - Internal Memorandum No. 2 - East West Resource Systems Institute: Honolulu.

1980: Famine Warnings: A Pragmatic Approach. Paper read at the ASEAN Disaster Preparedness Conference, Manila, February 28th.

1979: The Feasibility for a Famine Warning System for Bangladesh: The Need for a Geographical Information System. Ministry of Relief and Rehabilitation, Government of Bangladesh, Dacca, pp 150.

1979: Signals and Series for Famine Warnings in the Asia-Pacific Region. Paper presented at the Working Group on Food Security Issue-Information-Section III, East West Resource Systems Institute, Honolulu, June 18th-30th.

1978: "The Famine Syndrome: Its Definition for Prevention and Relief in Bangladesh. Journal of Ecology and Nutrition, Vol. 7, pp 87-98.

Dr Bruce Currey (contd)

1978: "Remote Sensing and Graphic Displays"  
in Curriculum Guide for Teaching Population  
Geography in Asian Universities. ed. G A Fuller.  
East-West Population Institute Publication,  
Honolulu.

1978: Map of Areas Liable to Famine in Bangladesh -  
Map No. 1. Maps of Vulnerable Food Systems in the  
Asian-Pacific, Food Systems Project,  
Resource Systems Institute, East-West Center,  
Honolulu.

Flinders University of South Australia  
 Sturt Road  
 BEDFORD PARK SA 5042 (08) 2753911

- \* Dr Stewart A Greenhalgh (08) 2752020 direct  
 Lecturer in Geophysics  
 School of Earth Sciences

General:

Disaster related work involves earthquake monitoring in South Australia using, as special resources, portable seismograph arrays, the Geophysical Vault at the University (seismograph, magnetometers, gravity meter), and Computer studies. A course is offered third year Geophysics students which is entitled.

"Earthquake Seismology and the Earth's Deep Interior".

No courses, seminars, or workshops are conducted for management personnel in disaster studies in this School.

- \* Mr R Smit, a previous post-graduate student completed his B. Sc. (Hons) Thesis (1980) entitled:

"Microearthquake Activity of the Adelaide Region".

Currently there are two graduate students working in Seismology, one of whom is involved in Microearthquake analysis using network data.

In the past there has been co-operation with the University of Adelaide on the earthquake project, and within the School of Earth Sciences at Flinders University exists the Institute for Australasian Geodynamics. There is co-operation and participation with Australian and overseas scientists, particularly from Indonesia. There are no graduates at present aspiring to higher degrees, in disaster-related studies, although this is to change in the next year or so. Constraints affecting research into disasters and natural hazards are seen to be staff ceilings and lack of research students. Future projects are related to the setting up of a digital telemetry earthquake network in South Australia.

38.

Flinders University of South Australia  
Sturt Road, BEDFORD PARK SA 5042 (08) 2753911

- \* Dr R L Heathcote  
Reader in Geography  
School of Social Science

General:

Disaster research aspects of interest to Dr Heathcote include:

- 1) DROUGHT - human adjustments (global, but USA and Australia especially), and
- 2) DESERTIFICATION - USA and Australia especially.

There are no courses specifically being conducted in disaster studies at under-graduate level, but the third year course "Environmental Perception and Behaviour" has about a quarter of its content concerned with "Human Adjustment to Natural Hazards". There are no courses, seminars, or workshops in disaster studies being conducted for management personnel. There are two Ph. D students involved in disaster-related research:

- \* M V A Tennakoon - Drought in Sri Lanka
- \* M Butler - Perception of Salinity in the River Murray

Details of desertification studies are to be found in:

"Perception of Desertification"  
R L Heathcote (Editor)  
UN University, TOKYO 1980 134pp

Dr Heathcote identifies research voids in hazard and disaster studies as "perception studies relating and identifying the vanity of resource managers whose activities are at risk and whose actions contribute to the magnitude of the disaster".

The Flinders University of South Australia,  
Sturt Road,  
Bedford Park. SA. 5042 (08) 275 3911

\* Professor G W Lennon,  
Chairman, School of Earth Sciences, and  
Professor of Oceanography

General:

Hazard or disaster related research includes

1. statistics of abnormal sea levels
2. storm surge research

There is one higher degree student working on the generation and progression of long waves.

Other work has involved projects in South Australia and the Great Australian Bight relating to long waves, cyclonic sea level response at the North-West Shelf and the West Coast, and the processing of a national data bank of sea level.

Special resources being used include computers for operations research and simulation, and instrumentation such as tide gauges and current meters for experimental studies.

There is a long-term contact with the Institute of Oceanographic Sciences in the United Kingdom, and there are also many links on a national scale within Australia.

Frequent advice is given to State Authorities and coastal engineers.

40.

The Flinders University of South Australia  
Bedford Park. SA 5042

(08) 275 3911

\* Professor Peter Schwerdtfeger,  
Professor of Meteorology, School of Earth  
Sciences and

Director, The Flinders Institute for Atmospheric  
and Marine Sciences

General:

The work carried out in this Institute is not specifically disaster oriented. The present study of the boundary layer of the atmosphere and meso-scale climates provides a basis for the assessment of the effectiveness of "land-use" philosophies. Also long term investigations and desertification potential of Eyre Peninsula studies have been carried out. Future research will include studies of wind stress effects on land surface and water loss by evaporation. This implies that gradually developing shortages of water in South Australia should ultimately be considered as being of "disaster potential". There is a need for a wide range of water resources related projects which will help prepare semi-arid parts of Australia to maintain adequate water supplies. Up to four graduate assistants, on temporary or short-term positions, are involved in the research. Special resources being used include experimental and computer equipment for both atmospheric and marine studies, tidal analysis facilities, and data archives (unique in Australia).

Constraints affecting research are identified as

1. inadequately prepared matriculants
2. insufficient research scholarship support for motivated graduates
3. lack of Government awareness of problems.



Griffith University  
Nathan, Queensland. 4111 (07) 275 7111

- \* Dr John S H Elkington  
Lecturer and School Administrator  
School of Science

Hazard-related research in this School involves studies of the chemical and physical stability of high level nuclear wastes.

Associated with this research are:

- \*\*\* Professor R L Segall, Dr S Myhra, Dr R St C Smart
- \*\*\* Dr P S Turner, Mr D R Cousens, Mr R A Lewis.

There is ongoing research into the "Evaluation of Critical Properties of Synroc for Disposal of High Level Radio-active Wastes". (NERDDC grant for 1981-83).

Mr D P Cousens, now a Research Associate, has carried out Ph. D studies into radiation damage effects in oxide glasses, and Mr R A Lewis has made similar studies relating to hydrothermal effects in glasses. There is co-operation with the Australian Atomic Energy Commission and the School uses the Commission's facilities at Lucas Heights. Special facilities used at the School of Science include autoclaves, surface analysis and electron microscopy, and analysis for species in solution. There are no under-graduate or post-graduate courses in this work.

James Cook University of North Queensland  
PO, James Cook University,  
Townsville. Qld. 4811 (077) 814111

The Centre for Disaster Studies  
Introduction by John Oliver, Professor and Head of  
the Department of Geography

The James Cook University of North Queensland began its active involvement in disaster mitigation following cyclone 'Althea' in December 1971 when it was commissioned by the Queensland Government to investigate the damage.

Staff from the then Department of Engineering and the Department of Geography were deeply involved in this investigation. The enquiry took two main directions - the behaviour of buildings under extreme forces, especially violent winds and the nature and prediction of storm surges. Following the investigation, research programmes and studies were developed in each of these Departments which have continued. These studies gained a further impetus from the cyclone 'Tracy' disaster in December 1974, in the investigation of which the University was again deeply involved. The Department of Behavioural Sciences has also developed an interest in human behavioural aspects of disasters, and there has been research activity in the Department of Physics related to tropical cyclone characteristics and detection.

To date most of the research activities have been discipline orientated and the results of initiatives undertaken by the individual Departments. This in part reflects the fact that the most urgent needs following cyclones 'Althea' and 'Tracy' were for specific information within relatively confined areas.

For example the major cause of community disruption in both cases was the structural inadequacy of housing. Consequently there was a demand for technical information on the structural behaviour of housing under wind loads which required the development of research programmes such as those which have been developed in the Department of Civil and Systems Engineering and which led to the establishment of the James Cook Cyclone Structural Testing Station as a co-operative venture between industry and the University.

In Geography the behaviour and the effect of tropical cyclones particularly on the Coral Sea coastline were studied. Some initial investigations into the community perception and response to severe storms was undertaken. Aspects of the impact of extreme environmental conditions on natural phenomena were also studied.

However, with these programmes now established attention is increasingly being devoted to the more fundamental aspects of natural disasters. Because disasters are mainly the consequence of the interaction between natural hazards and human communities, any such studies must invariably involve inter-disciplinary activities associated with the nature of the hazard and its detection, the nature of communities from a geographic, technological and economic point of view, and human reaction to disaster and the associated risks.

It is not so easy for individual Departments to promote this type of research, nor easy for outside organisations seeking information of this nature to know whom to approach in the University for it. Thus, while individual Departments are being very effective within their own particular disciplines in relation to disaster mitigation, the University as a whole is not being as effective as it could be in relation to the wider problems such as civil defence planning, insurance and community preparedness, owing to the fragmented nature of the overall management of disaster mitigation.

Disaster mitigation, by its nature, requires the involvement of large sections of the community for the effective implementation of the results of research studies. This can only be achieved by continuing public education activities in which it is clear that the University has a significant role to play. The University is already playing a useful role in this respect; for instance the recent community directed seminars on Natural Disaster and Community Welfare organised by the Department of Behavioural Sciences in Townsville, Mackay and Cairns, the Vacation School on Design for Tropical Cyclones organised by the Department of Civil and Systems Engineering in conjunction with the James Cook Cyclone Structural Testing Station, and the seminar in July 1979 on Response to Disaster. However, while interdisciplinary in nature the organisation of these is dependent on the initiative and willingness of individual Departments and the scope of them may not be as wide as it could be. They also tend to suffer from a lack of follow-up activities due to the pressure of other commitments on academic staff following a heavy commitment to the actual activity. Although Departments would still have to bear the major burden of these activities as far as presentation of material is concerned, the contribution of the Centre to the promotion, organisation and follow-up activities would add greatly to the overall effectiveness of them. It could also promote co-operative educational ventures with other organisations in the community.

The Council of the University, on 4th April, 1979, approved the establishment of the Centre on the basis of the following recommendations:

44.

1. That a Centre for Disaster Studies be formed within the James Cook University of North Queensland to co-ordinate at an interdisciplinary level the various activities being undertaken within the University in relation to disaster mitigation, particularly those relating to tropical cyclones; to provide a focus for communication between the University and the community in this field, and to foster increased research and development at national and international levels.

2. That the Centre comprise all staff engaged in activities related to Disaster Mitigation. At present those persons concerned, together with their particular interests, are listed in Appendix I.

3. That the Centre be managed by a committee, the membership of which will include members of academic staff engaged in research activities relevant to disaster mitigation.

4. That the function of the Centre be to:

- (i) encourage and promote interdisciplinary research in the field of disaster mitigation;
- (ii) provide a post-disaster investigation team available at national, and if necessary international, level in the event of a disaster and establish and maintain links with the appropriate bodies for its effective operation;
- (iii) provide an information service to the community on disaster mitigation measures through newsletters, publications and educational programmes;
- (iv) develop and maintain links with other organisations and institutions both in Australia and overseas involved in disaster mitigation activities.
- (v) co-ordinate disaster related consultancies involving multi-disciplinary studies.

5. That a Steering Committee be established to prepare detailed proposals within the framework of Recommendations 1-5 above, the Steering Committee to comprise: Professor D. H. Trollope (Chairman), Professor G.E. Kearney, Professor J. Oliver (Deputy Chairman), Professor K.P. Stark, Professor J.F. Ward, A/Professor G.R. Walker (Secretary).

CENTRE FOR DISASTER STUDIES STEERING COMMITTEE

Chairman:

- \* D H Trollope (077) 814335  
Deputy Vice-Chancellor and Professor of  
Civil Engineering

Deputy Chairman:

- \* J Oliver, (077) 814521  
Professor and Head of the Department of Geography

Secretary:

- \* G R Walker, (077) 814176  
Associate Professor of Civil Engineering,  
Department of Civil and Systems Engineering

Member:

- \* K P Stark (077) 814270  
Professor of Systems Engineering and Head of the  
Department of Civil and Systems Engineering

Member:

- \* G E Kearney (077) 814182  
Professor and Head of the Department of Behavioural  
Sciences

Member:

- \* J F Ward (077) 814117  
Professor and Head of the Department of Physics

46.

JAMES COOK UNIVERSITY OF NORTH QUEENSLAND

CENTRE FOR DISASTER STUDIES

DISASTER RELATED RESEARCH TOPICS

STUDIED OR UNDER STUDY AT THE UNIVERSITY

Department of Geography

- (1) Atmospheric and hydrological studies of natural hazards, particularly tropical cyclones, floods, bush fires and droughts;
- (2) Studies of human awareness and perception of hazards and disaster situations;
- (3) Evacuation of environmental extremes and their physical social and economic consequences;
- (4) Vulnerability analysis problems;
- (5) Analysis of hazard/disaster management strategies;
- (6) Warning procedures;
- (7) Education in disaster prevention and preparedness.

Department of Behavioural Science

Human behavioural aspects of disasters with particular respect to those arising from tropical cyclones, floods and hailstorms including

- (1) human awareness and perception of potential disaster situations;
- (2) effectiveness and improvement of warning systems;
- (3) trauma and other psychological effects on people of disasters;
- (4) organisation of social welfare to cope with disaster victims.

Department of Physics

Physical properties of tropical cyclones and their mechanisms of formation, steering and possible amelioration.

Department of Electrical and Electronic Engineering

Interpretation of satellite data on tropical cyclones.

Department of Civil and Systems Engineering

- (1) wind loads on housing and other low rise buildings;
- (2) effects of hills on wind velocities;
- (3) structural behaviour of houses under wind loads;
- (4) generation and prediction of storm surges by tropical cyclones;
- (5) generation and prediction of waves due to tropical cyclones;
- (6) establishment of criteria for the design of buildings and coastal facilities in tropical cyclone prone areas;
- (7) computer simulation of the impact of a tropical cyclone on a community;
- (8) development of computer models to simulate and plan evacuation due to impending hazard;
- (9) investigation of damage due to wind, earthquake, fire and flood;
- (10) hydrological aspects of flood prediction and control in respect of both river flooding and urban drainage;
- (11) mechanics of landslides;
- (12) risks to shipping in the region of the Great Barrier Reef;
- (13) pollution of underground water supplies by toxic wastes.

JAMES COOK UNIVERSITY OF NORTH QUEENSLANDCENTRE FOR DISASTER STUDIESSTAFF AND STUDENTS ASSOCIATED WITH DISASTER RELATED STUDIES

(Note: Those marked thus \*\* are no longer with the University)

Department of Behavioural Sciences:

- |   |   |   |
|---|---|---|
| Professor G.E. Kearney<br>(Committee Member)                          | : | Professor of Behavioural Sciences.<br>Human response to natural hazards.                      |
| * Dr. J.P. Reser  | : | Senior Lecturer in Behavioural Sciences.<br>Human response to natural hazards.                |
| ** Mrs. J. Innes Reid<br>(Mrs Innes Reid left the University in 1981) | : | Field work Co-ordinator in Behavioural Sciences.<br>Community welfare in disaster situations. |
| * Mr. N. Britton  | : | Tutor in Behavioural Sciences.<br>Human response to natural hazards.                          |

Department of Physics:

- |   |   |  |
|---|---|--|
| Professor J.F. Ward<br>(Committee Member) | : | Professor of Physics.<br>Physical mechanism of tropical cyclones.                          |
| * Dr. M.L. Heron                          | : | Senior Lecturer in Physics.<br>Radar studies of ocean surface during tropical cyclones.    |
| * Dr. B.C. Gibson-Wilde                   | : | Senior Lecturer in Physics<br>Electrical and radio measurement of cyclone characteristics. |
| ** Mr. R. McKenzie                        | : | Post Graduate student.   |



Department of Geography:

- Professor J Oliver : Professor of Geography  
(Deputy Chairman) Characteristics of tropical cyclones. Mitigation of disasters arising from natural hazards.
- \* A/Professor D Hopley : Associate Professor in Geography  
Effect of cyclones in coastal geomorphology.
- \*\* Dr N Harvey : Post-Graduate student.  
Storm surges.
- \*\* Mr K Frawley : Tutor in Geography.  
Floods.
- \*\* Mrs A Pillans : Honours student in Geography  
Bush fires
- \*\* Mr H Stride : Honours student  
Tropical cyclone perception.

Department of Electrical and Electronic Engineering:

- \* Dr G H Allen : Lecturers in Electrical and  
\* Dr T S Bird Electronic Engineering.  
\* Dr R R Bitmead Monitoring and analysis of  
\* Dr J Wicking satellite information on  
tropical cyclones.
- \* Mr A Shipman : Post-Graduate student as above.

Department of Civil and Systems Engineering:

- Professor K P Stark : Professor of Systems Engineering  
(Committee Member) Computer simulation of tropical cyclone characteristics and effects. Systems approach to disaster mitigation.
- Professor D H Trollope : Deputy Vice-Chancellor and  
(Chairman) Professor of Civil Engineering.  
Interdisciplinary management procedures. Foundations of structures, landslides.  
Aerodynamic response of structures.

50.

- A/Professor G.R. Walker : Associate Professor in  
(Secretary) Civil Engineering.  
Structural design of  
housing to resist  
tropical cyclones.  
Earthquake engineering.  
Simulation of disasters.
- \* Dr R.J. Sobey : Senior Lecturer in Civil  
Engineering.  
Coastal engineering  
problems of cyclones.
- \* Dr. J.D. Holmes : Senior Lecturer in Civil  
Engineering.  
Wind tunnel investigation  
of wind loads and wind  
characteristics.
- \* Dr. R.E. Volker : Senior Lecturer in Civil  
Engineering.  
Flood mitigation.  
Pollution of underground  
water supplies.
- \* Dr. M.K. James : Lecturer in Systems  
Engineering Risk to  
shipping in reef waters.
- \* Mr J.D. Eckersley : Lecturer in Civil  
Engineering. Landslides.
- \* Mr. R. Roy : Research Officer.  
Wind loads on houses.
- \* Mr. W.E. Steen : Research Officer.  
Wind speeds near hills.  
Pollution of underground  
water supplies.
- \* Mr. D. Gonano : Research Officer.  
Structural strength of  
of housing.
- \* Mr. I.R. Young : Post Graduate Student  
Generation of waves by  
tropical cyclones.
- \*\* Mr. B.A. Harper : Research Officer.  
Modelling of storm surge.
- \*\* Mr. G.M. Mitchell : Post Graduate Student.  
Wave loading of structures.

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AUSTRALIAN DISASTER RESEARCH DIRECTORY (INCLUDING SOME  
CONTRIBUTIONS FROM NEW ZEALAND) PROVISIONAL -- 1983(U)  
AUSTRALIAN COUNTER DISASTER COLL MOUNT MACEDON

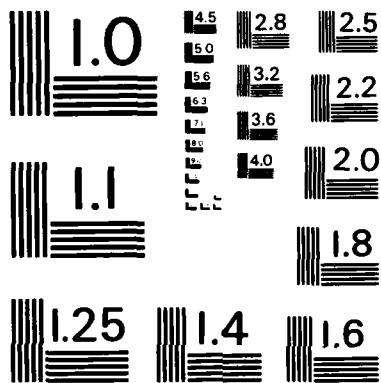
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MICROCOPY RESOLUTION TEST CHART  
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- \*\* Mr. E.J. Colman : Post Graduate Student.  
Wave generation.
- \*\* Mr. A.S. Baker : Research Officer.  
Computer Simulation of  
tropical cyclone effects.
- \*\* Mr. R.P. Buchanan : Post Graduate Student.  
Structural behaviour of  
masonry construction.
- \*\* Mr. R.J. Best : Research Officer.  
Wind loads on houses.
- \*\* Dr. M. Dunbaven : Post Graduate Student.  
Landslides
- \*\* Dr. V. Guvanasen : Post Graduate Student.  
Pollution of underground  
water supplies.

James Cook Cyclone Structural Testing Station

- \* Mr. G.F. Reardon : Technical Director  
Wind resistant building  
construction
- \* Mr. G.N. Boughton : Research Fellow  
Wind resistant building  
construction
- \* Mr. S.J. Bourne : Research Fellow  
Wind resistant building  
construction

52.

JAMES COOK UNIVERSITY OF NORTH QUEENSLAND

CENTRE FOR DISASTER STUDIES

COURSES AT UNDERGRADUATE LEVEL RELEVANT TO DISASTER STUDIES

Department of Physics:

Ph365 : Atmospheric and Terrestrial Physics

Department of Geography:

GE101 : The Geographical Environment

GE204 : Natural Environmental Studies

GE308 : Climatology

Department of Behavioural Sciences:

BH170 : Introduction to Social Welfare

BH362 : Environmental Psychology

Department of Civil & Systems Engineering:

CS402 : Civil Engineering Design I

CS402 : Civil Engineering Design III

CS435 : Geo-Engineering

CS437 : Hydraulic Engineering

JAMES COOK UNIVERSITY OF NORTH QUEENSLAND

CENTRE FOR DISASTER STUDIES

COURSES, SEMINARS, WORKSHOPS ETC RELEVANT TO  
DISASTER MANAGEMENT ORGANISED BY UNIVERSITY

- \* A Vacation School on Design for Tropical Cyclones held in 1972. This was a 3-day symposium aimed primarily at the building industry and the engineering profession.
- \* The Fifth International Symposium on Equatorial Aeronomy hosted by the Department of Physics dealt among other things with mechanisms of formation and behaviour of tropical cyclones.
- \* Seminars on Natural Disaster and Community Welfare held in 1977 and 1978. These were a series of day seminars organised in Townsville, Mackay and Cairns by the Social Work Program of the Department of Behavioural Science at the University and directed primarily at members of the local communities involved in counter disaster activities.
- \* A Vacation School on Design for Tropical Cyclones held in 1978. This was a 4-day symposium aimed at presenting the State-of-the-Art in the engineering profession and building industry on design for tropical cyclones by bringing together experts on the subject from throughout Australia.
- \* A Workshop on Tropical Cyclones concerned with their physical characteristics to coincide with the visit to Australia of members of the U.S. Stormfury project.
- \* A Seminar on Response to Disaster held in 1979. This was a 3-day symposium organised by the Department of Geography in conjunction with the Centre for Disaster Studies. It brought together the experts and leaders in counter disaster activities in Australia.
- \* A United States-Australia Workshop on Coping with the Impact of Cyclones and Hurricanes on Domestic Construction held in 1980. This Workshop, organised under the auspices of the U.S.-Australia Co-operative Science Program, brought together experts from Australia and the United States to discuss the State-of-the-Art of research, developments and practice in the design and construction of housing in tropical cyclone prone areas of the 2 countries. It was organised in conjunction with the Institute for Disaster Research, Texas Tech University, U.S.A.

54.

In addition staff have actively contributed to many seminars, workshops, and conferences at local, national and international level on subjects relating to disaster management.



JAMES COOK UNIVERSITY OF NORTH QUEENSLANDCENTRE FOR DISASTER STUDIESCURRENT POST GRADUATE STUDENTS WORKINGON DISASTER RELATED SUBJECTSDepartment of Behavioural Science:

Mr. N. Britton : PhD Student  
Human perception of  
disaster prone situations.

Department of Electrical & Electronic Engineering:

Mr. A. Shipman : MEngSc Student  
Analysis of satellite  
information on cyclones

Department of Civil & Systems Engineering:

Mr. I. Young : PhD Student  
Generation of waves by  
tropical cyclones.

Mr. G. Boughton : PhD Student  
Behaviour of houses in full  
scale under simulated wind  
loads.

Mr. J.D. Eckersley : PhD Student  
Mechanism of landslides

Mr. R. Roy : MEngSc Student  
Wind tunnel measurement of  
wind loads on buildings.

Mr. D. Gonano : MEngSc Student  
Structural behaviour of  
diaphragm elements in  
housing construction.

Mr. W.E. Steen : MEngSc Student  
Pollution of underground  
water supplies.

JAMES COOK UNIVERSITY OF NORTH QUEENSLANDCENTRE FOR DISASTER STUDIESPUBLICATIONS LIST

## 1. Human Response to Disaster

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- 1979 Reser, J.P. & Innes Reid, J. Some Behavioural Observations and Implications for Research. Cyclone Peter - Effects on Cairns - January 1979. Disaster Investigation Report No. 1. Centre for Disaster Studies, James Cook University, 1979, pp. 12-14.
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## 2. Community Response to Disaster

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7. Wave Studies.
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- 1978 Sobey, R.J. Wind Wave Frequencies in a Tropical Cyclone Region. Procs. 16th International Conference on Coastal Engineering, Hamburg, August - September 1978, 1, pp 76-96.
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- 1980 Young, I.R. and Sobey, R.J. A Predictive Model of Tropical Cyclone Wind Waves. Procs., Seventh Australasian Hydraulics and Fluid Mechanics Conference, Brisbane, October, 1980. pp. 400-482.
- 1981 Sobey, R.J., Young, I.R. and Mills, A.B. Hindcasting Total Water Level Hydrographs in a Tropical Cyclone Environment. Procs., Fifth Australian Conference on Coastal and Ocean Engineering, Perth, November 1981 (to appear).
- 1981 Young, I.R. and Sobey, R.J. Wave Prediction Techniques in Nearshore Environment. Procs. Environmental Engineering Conference, Institution of Engineers Australia, Townsville, July 1981.
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8. Flood Studies

- 1978 Frawley, K.J. The 1977 Ingham Floods. Geographical Studies of the Townsville Area (Ed D. Hopley), Department of Geography, Occasional Paper 2, James Cook University of North Queensland, p 34, 1978.
- 1980 Gilmour, D.A. and Bonell, M. An investigation of the storm drainage processes in a tropical rainforest catchment, Australian Water Resources Council, Technical Paper Series AGPS, Canberra, 1980 93 pp.

- 1980 Oliver, J. A review of flood problems in tropical Queensland, Disasters, 4(4), pp 459-469, 1980.
9. Landslide studies
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- 1977 Trollope, D.H. Sequential Failure in Strain Softening Soils. Proc. 8th International Conference on Soil Mechanics and Foundation Engineering, Moscow, 1973.
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10. Earthquake Studies
- 1969 Walker, G.R. Earthquake Engineering Design Philosophy. Proc. Earthquake Engineering Symposium, Melbourne, 1969.
- 1980 Britton, N.R. Society, Prediction, and Warning: Current Assumptions on Earthquake Forecasting. Bulletin of the New Zealand National Society for Earthquake Engineering, Vol 13, No. 4, pp 365-373, 1980.
- 1981 Britton, N.R. What have New Zealanders Learnt from Earthquake Disasters in Their Own Country? Large Earthquakes in New Zealand: Anticipation, Precaution, Reconstruction, Miscellaneous Report 5, Royal Society of New Zealand, pp 191-197. 1981.
- 1981 Britton, N.R. What have New Zealanders Learnt from Earthquake Disasters in Their Own Country (Expanded Version). Disasters, Vol 5, No. 4, Dec 1980. 1981. 384-390.

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1982 Britton, N.R. New Zealand Society and Earthquake Insurance: Effectiveness Versus Avoidance? Proceedings of the Third International Conference on Microzonation for Safer Construction, University of Washington, Seattle, 1982. Vol 1 Session III 301-314.

1982 Britton, N.R. The Perception of Earthquake Prediction: A New Zealand Case study, Proceedings of the International Symposium on Earthquake Prediction, 1979, Paris, France (UNESCO Press) (Forthcoming). Section 6: 26-49.

11. Severe Storm Studies

1979 Gilmour, D.A. and Bonell, M. Six-minute rainfall intensity data for an exceptionally heavy tropical rainstorm, Weather, 34, 1979, pp 148-158.

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- \* H.T. Burley, B.Ec.(Adel). M.A., Ph.D.(Cantab), F.S.S.  
Senior Lecturer in Econometrics

#### General

Dr. Burley is involved in studies concerning the incidence, the causes, the treatment and rehabilitation of spinal injury. About 50% of spinal injury incidence arises from non road trauma. Sporting, domestic, and occupational risks are high and the consequential disaster is very expensive to the community, family and person. He envisages future research involving a study of etiology (causes) remote, proximate, and immediate of spinal injury with a view to the worthwhileness of prevention schemes.

#### Contacts and Connections

- \* Dr David C Burke,  
Medical Director, Spinal Unit,  
Austin Hospital,  
Heidelberg. Victoria 3084  
(Dr Burke is on the ACROD spinal unit committee)

National Spinal Cord Injury Data Research Center  
Phoenix, Arizona, U.S.A.

Also information links with Australian interstate spinal units and general co-operation with them (complete co-operation with the Austin Hospital spinal unit). This research is funded by the Royal Australasian College of Surgeons' Road Trauma Committee.

#### Special Resources

Special resources used in this research include questionnaire surveys and computers.

#### Constraints

The main constraint affecting this research is seen to be funding.

78.

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- \* Professor E L Jones  
Professor of Economics  
School of Economics

Professor Jones has an interest in the economic consequences of very long-term patterns of disaster. Others who have been involved are:

- \* Mr G W Raby, Tutor in Economics (to 1980)
- \* Ms A D Nelson, Research Assistant (1980-81)
- \* Mr J L Anderson, Senior Lecturer
- \* Mr C M White, Lecturer

With regard to under-graduate work there is a topic introduced in a small number of courses with reference to the effects of risk, uncertainty and the different shapes of shocks.

Future hazard-related work includes the development of a fire research project, and possibly the implications of different climatic profiles. A research void is seen to be in the long-term effects of, and adjustments to, disaster profiles affecting developed and less developed economies: Europe, Asia and Australia.

By way of information exchange Professor Jones has personal contact with overseas workers in historical and modern fields of disaster research, mostly through correspondence, but there have been a number of visits to Institutions and Conferences in England.

A research constraint is seen in the funding of post-doctoral research workers, research assistants, and funding of travel by existing staff.



## LaTrobe University (continued)

## Publications and Projects completed:

- J L Anderson  
 "Climate and the Historians" in  
Climatic Change and Variability. A Southern  
 Perspective  
 A B Pittock et al  
 Cambridge University Press (1978)
- J L Anderson  
 "Climatic Change in European Economic History"  
Research in Economic History, 6 (1981), pp 1-34.
- G W Raby  
 "Aspects of the Impact and Response to Drought  
 in New South Wales 1821-1849".  
 M. Ec Thesis  
 LaTrobe University, December 1980, 260 pp
- E L Jones  
 "Creative Disruptions in American Agriculture,  
 1620-1820"  
Agricultural History XLVIII (1974), pp 10-28
- E L Jones  
 "Societal Adaptions to Disasters".  
Biology and Human Affairs 42 (1977), pp. 145-149
- E L Jones  
 "Disaster Management and Resource Saving in Europe" in  
Natural Resources in European History  
 (Washington, DC: Resources for the Future, 1978)  
 A Maczak and W N Parker (eds).
- E L Jones  
 "Fire Disasters: the Special Case of East Devon"  
The Devon Historian, 20 (1980), pp. 11-17
- E L Jones  
 "Disasters and Capital Accumulation" and passim  
The European Miracle, Chapter 2  
 Cambridge University Press, (1981)

80.

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\* Dr Russell Blong  
Senior Lecturer  
School of Earth Sciences

Hazard-related research which has been, or is  
being, carried out:

- (a) volcanic hazards - the effects of volcanic eruptions on people, societies, buildings, business activity, plants and animals (Dr R J Blong)
- (b) bushfire hazards - perception of the bushfire hazard by residents of Sydney suburbs (Drs S J Riley & R J Blong).
- (c) flood hazards - with special reference to Hawkesbury-Nepean; flood processes and flood characteristics; magnitude and frequency of flood events (Dr Riley).
- (d) epidemiology of disease - both historical and contemporary; particularly epidemics of infectious diseases (Dr P H Curson).
- (e) coastal erosion hazard - long term coastal erosion and coastal sediment budgets (Prof J L Davies)
- (f) soil erosion - specifically soil loss-runoff, gully erosion, slope stability/landslides. Measurements of amounts of soil loss, rates of movement, processes involved and risk analysis of landslides. Erosion and sediment yield following bushfires; effects of bushfires on soils (Drs Blong & Riley, A/Prof M A J Williams, Mr Mitchell).
- (g) air pollution - studies of air pollution concentration in various environments, brown haze over Sydney, development of models to estimate ozone concentrations and mixing heights in boundary layer (Drs R Hyde and I G Watson, A/Prof E T Linacre).

Positions of the abovementioned research workers in the University:

- \* Dr S J Riley - Lecturer in Earth Sciences
- \* Mr P B Mitchell - Senior Tutor in Earth Sciences
- \* Dr P H Curson - Senior Lecturer in Earth Sciences
- \* Professor J L Davies - Professor of Geography

## Macquarie University (continued)

- \* Prof M A J Williams - A/Professor in Earth Sciences
- \* Dr R Hyde - Senior Lecturer in Earth Sciences
- \* Dr I G Watson - Lecturer in Earth Sciences
- \* A/Prof E T Linacre - A/Professor in Earth Sciences

A number of research assistants and post graduate students are also involved in various projects.

## Under-graduate courses in natural hazards:

Course GEO237 Natural Hazards managed by Dr Blong provides a general introduction to Natural Hazards. The course provides "An introduction to selected natural hazards such as earthquakes, volcanic eruptions, tropical cyclones, tornadoes, bushfires, droughts, floods, avalanches and landslides. Aspects considered include the physical processes involved, the forecasting of hazardous events and the perception of, adjustment to and mitigation of natural hazards. The distribution of hazards on local, national and global scales is examined".

This course is taught on both external and internal schedules to about (in 1981) 80 students. As a second year General Education course there are no prerequisites to the course but enrolling students must have satisfactorily completed one year at University.

Other courses within the school consider some aspects of natural hazards/disasters. GEO366 Advanced Geomorphology considers aspects of gully erosion and slope stability including landslide risk analysis. GEO213 Climatology considers air pollution and the relevance of climate to people. Some more advanced aspects are examined in GEO393 Applied Climatology. Other courses in Land Management and Population Geography, for example, examine aspects of natural hazards as diverse as erosion control and the spatial analysis of morbidity and mortality.

## Post-graduate effort:

Some projects have research assistants and/or post-graduate students working on specific aspects.

## Teaching Projects:

These include a two day continuing education school for high school geology teachers on volcano, earthquakes and flood hazards.

Macquarie University (contd)

Special Resources:

Many of the research efforts are field-based and concerned with field measurement of current processes using a variety of special equipment. Computers have been used for analysis of volcanic ash fallout, flood frequency and flood characteristic analysis, slope stability analysis, pollutant concentration studies and the analysis of questionnaire surveys and records of diseases. Projects on floods, coastal erosion, soil erosion and air pollution have involved the installation and maintenance of a variety of mechanical and electronic recording devices.

Links with other organizations:

Reasonably good links are maintained with a variety of relevant organizations and institutions. Some organizations provide funds, other expertise. In some cases, particularly links with interstate or international organizations, lack of funds limits co-operation. The following list provides examples of co-operative links (the list is not exhaustive).

- (a) Volcanic hazards project - co-operative links with U.S. Geological Survey and Smithsonian Institution. Some links involving co-operative research with Papua New Guinea Volcanological Observatory, Rabaul. Supported in part by ARGC and Smithsonian Institution.
- (b) Bushfire hazards project - contact with and assistance from Warringah Shire Council Fire Control officer.
- (c) Flood hazards project - some equipment lent by NSW Water Resources Commission, and UNSW. Good contacts with Colo Shire Council and Windsor Shire Council. Some funds provided by Water Research Foundation of Australia.
- (d) Epidemiology of disease - supported in part by Australian Research Grant Committee.

Macquarie University (contd)

Publications 1978-80

1978

Blong, R J Slope stability and tephra mantles in the Papua New Guinea Highlands (with C F Pain). Geotechnique 28, 2: 206-210

Heggie, A C and Hyde R. Study of an oxidant day in Sydney (with G S Hawke, A Mitchell and R Rothwell). In E T White et al. (eds), Clean Air--The Continuing Challenge, Proceedings of the International Clean Air Conference, Brisbane, Ann Arbor Sci. publ.: 105-118.

Hyde, R and Heggie A C. The transport and recirculation photo-chemical smog across the Sydney Basin. I Inland (with G S Hawke). In E T White et al (eds), Clean Air--The Continuing Challenge, Proceedings of the International Clean Air Conference, Brisbane, Ann Arbor Sci. publ.: 119-134.

Hyde, R and Heggie A C. The transport and recirculation of photo-chemical smog across the Sydney Basin. II. At the coast (with G S Hawke). Ibid.: 157-166.

Riley, S J Modifications to floods passing through, and contributed to by urban areas. Section I. Introduction and data. Water Research Foundation of Australia Project 75/312: 309pp.

Riley, S J. The March 1976 flood on the Hawkesbury and Nepean River between Penrith and Pitt Town. Geography Bulletin 10: 42-65

Williams, M A J. Water as an eroding agent. In K M W Howes (ed.), Studies of the Australian Arid Zone. III. Water in Rangelands, CSIRO, Perth: 79-89.

1979

Blong, R J. The distribution of tephras in the Papua New Guinea Highlands (with C F Pain). Search 10, 6: 228-230.

Williams, M A J. Droughts and long-term climatic change: recent French research in arid North Africa. Geog. Bull. 11: 82-96.

84.

Macquarie University (contd)

1980

Baczowski, D M. Viral hepatitis in metropolitan Sydney. Australian Geographer 14, 5; 285-295.

Blong, R J. The possible effects of Santorini tephra fall on Minoan Crete. In C Dumas (ed.). Thera and the Aegean World, 2 Papers and Proceedings of the Second International Scientific Congress, Santorini, Greece, August 1978, Thera and the Aegean World, London; 218-226.

Blong, R J . Socioeconomic effects of Mt St Helens May 18 eruption. SEAN Bulletin 5, 5; 5-6

Riley, S J. Implication of current models of runoff production to soil conservation practice. Geog. Survey, 9, 1; 22-38.

Riley, S J. Aspects of the flood record at Windsor. Proc. Inst. Aust. Geog. 16th Conference, Newcastle; 325-340.

Riley, S J. A geomorphologist's view of stormwater management. In Urban Stormwater Management, Warringah Shire Council, March, 1980; 5-12.

\* Mr. Malcolm H. Mathias  
16 Anthony Street  
Ormond, Vic. 3204 (03) 5789376

Mr. Mathias was formerly a Lecturer in Physical Geography at the Melbourne State College. At present he is a Ph.D. Student in the Geography Department at Monash University with Dr. J. Peterson as supervisor. His proposed thesis is to be entitled:

Flood Plain Management in Victoria 1862 - 1982;

A Geographic Perspective on the Evolution of Policy and Practice in a Development Physical and Cultural Landscape.

Mr. Mathias' disaster-related interests are concerned with flood-plain management and he has contacts with the Melbourne and Metropolitan Board of Works, the Victorian State Rivers and Water Supply Commission, and the Dandenong Valley Authority. He is also a member of the Advisory Committee of the Centre for Information and Research on Disasters and Natural Hazards (CIRDNH) (qv), and a member of the Natural Disaster Action Committee (qv).

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- \* Dr J A Peterson  
Senior Lecturer  
Department of Geography  
Faculty of Arts

Dr Peterson conducts a second year course which relates to the nature of environmental stability. It is possible that facilities will be obtained to upgrade teaching in cartography and remote sensing so that the monitoring of hazards can be dealt with in future courses. Dr Peterson is supervising a research student working on flood-plain management, and another working on monitoring grass fire hazard from satellite data. Special resources being used include computers for data processing, and a significant constraint results from funding of research scholarships difficulties. There is contact with the Natural Disasters Action Committee (qv).

- \* Mr Judd A Epstein  
Senior Lecturer in Law  
Faculty of Law

Hazard-related interest:

Legal implications of frangible poles for roadside safety.

Relevant Publication:

Epstein, J. "Roadside Hazards - The Legal Implications" in Fixed Roadside Hazards Symposium. Australian Road Research Board 1977.

- \* Lucy L Hunter, Research Fellow, has also been involved with this research.

A possible research void is seen in the legal implications of defective vehicle manufacture.

86.

Monash University,  
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- \* Professor W H Melbourne  
Professor of Fluid Mechanics and  
Chairman of the Department of Mechanical Engineering.

Professor Melbourne has been involved with research in wind engineering and coastal engineering, together with

- \*\* Associate Professor J B Hinwood and Dr D R Blackman.

There are also six research scholars working in these areas. No courses or sections of courses are conducted at under-graduate level in disaster studies, but there are graduate courses given in Wind Engineering, Ocean Engineering Structures and Coastal Engineering. Special resources used in research include computers for cyclone and storm surge simulation, wind tunnels and structural models.

Hazard-related publications list from 1975 to 1981 inclusive is to be found in following annex.



ANNEX

MONASH UNIVERSITY, Department of Mechanical Engineering

PUBLICATIONS IN INTERNATIONAL JOURNALS AND REFERRED CONFERENCE  
PROCEEDINGS RELEVANT TO STRUCTURES IN DYNAMIC ENVIRONMENTS  
1975-1981

Monographs

- Aynsley, R., Melbourne, WH, Vickery, BJ, Architectural  
Aerodynamics, Applied Science Publishers 1977.
- Melbourne, WH, Editor, Wind Loading and Wind Effects, Ch.3,  
pp 144-248, Monograph Tall Building Criteria and  
Loading, American Society of Civil Engineers 1980.
- Hinwood, JB The Port of Melbourne Environmental Study,  
University of Melbourne, December 1980 (700 pp).
- Murray, NW & Thierauf, G Tables for the Design and  
Analysis of Stiffened Plates, Vieweg, 1980 (200 pp).
- Murray, NW The Theory of Thin-walled Steel Structures  
(in preparation).

Papers

1975

- Melbourne, WH Probability distributions of response of BHP  
House to Wind Action and Model Comparisons, Jnl.  
Ind. Aerodynamics, 1(1975) 167-175.
- Melbourne, WH Cross-Wind Response of Structures to Wind  
Action, Fourth Int. Conf. on Wind Effects on Build-  
ings and Structures, Heathrow 1975, pp 343-358.
- Saunders, JW & Melbourne, WH, Tall Rectangular Building Res-  
ponse to Cross-wind Excitation, Fourth Int. Conf.  
on Wind Effects on Buildings and Structures,  
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Monash University,  
Wellington Road,  
Clayton. Vic. 3168

(03)5410811

- \* Professor O E Potter,  
Chairman, Department of Chemical Engineering.

Research is carried out concerning the production of liquid synthetic transport fuels, and water and waste water treatment. At under-graduate level there are lectures on safety in process industries, air pollution and water pollution abatement, and at post-graduate level there are courses on air and water pollution abatement. Course-work has emphasis on counter-disaster planning, public awareness, aspects of man-made disasters, and desirable design. Others who are involved in aspects of such research are

- \*\* Associate Professor J B Agnew and Dr G A Holder,  
Senior Lecturer.

There are graduates working towards higher degrees on

1. the production of synthetic liquid transport fuels, and
2. wastewater treatment

92.

Monash University,  
Wellington Road,  
Clayton. Vic. 3168

(03) 541 0811

\* Dr Robert E Melchers,  
Senior Lecturer,  
Department of Civil Engineering

Dr Melchers has a strong interest in "man-made" disasters, mainly in the structural engineering area, but also more generally. He has submitted the following brief details for inclusion in this publication.

#### Research Interests

1. Patterns in failures of structural engineering projects.
2. Control procedures and safety checking in engineering projects.
3. Effect of human error in structural reliability.
4. Reliability of structures with strength deterioration.

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Monash University,  
Wellington Road  
Clayton. Vic. 3168

(03) 541 0811

Professor E M Laurenson,  
Head, Department of Civil Engineering

The nature of hazard research with which this Department is involved includes the following :

- a. flood mitigation studies (specific projects)
- b. flood mitigation studies (general research)
- c. investigations into structural failures (specific projects)
- d. investigations into structural failures (general research)

Members of the Department concerned with a. and b. above are

- \* Dr R J Keller, Senior Lecturer
- \* Dr R G Mein, Senior Lecturer
- \* Dr G C Codner, Lecturer

Associated with c. above are

- \* Professor N W Murray, Professor of Structural Engineering, and
- \* Associate Professor P Grundy

General research into item d. is being carried out by

- \* Dr R E Melchers, Senior Lecturer (see separate entry)

Under-graduate course work does include some flood mitigation work. Flood studies are conducted at fourth year under-graduate level, and courses at Master's level include flood mitigation measures, design criteria and studies, and aspects of human error and structural reliability. There are also workshops using computer models for flood predictions.

Some of the research is carried out at low-key level because of lack of outside support which has been difficult to obtain. Funding, in terms of that necessary for research students to carry out such research or for specific research assistance, is seen to be a particular constraint. The Department maintains co-operation mainly with overseas research groups, and exchanges take place in the usual way at conferences, through occasional visits, and via personal communications.

94.

Mount Gravatt College of Advanced Education,  
Messines Ridge Road,  
Mount Gravatt. Queensland. 4122 (07) 349 7033

- \* Dr Keith Tronc,  
Assistant Director

This College carries out research into the development of paper and pencil simulation exercises for training school personnel. There is no under-graduate course work in disaster-related studies, but in the Graduate Diploma in Educational Administration programme there is emphasis on counter-disaster planning, administration in disaster, public awareness for disaster, and emergency procedures for school personnel. There is also close co-operation with the Queensland State Emergency Service.

Murdoch University,  
Murdoch, Western Australia, 6150 (09) 332 2211

- \* Dr Desmond O'Connor  
Professor of Environmental Studies,  
School of Environmental and Life Sciences

General :

The nature of disaster-related research being undertaken relates to cyclone research and prediction, and this involves Ph.D. studies. Also involved in this work is

- \* Dr T Lyons, Lecturer in Atmospheric Science

Constraints affecting research are seen to be funding and staff ceilings. Special resources being used include computers, wind tunnel and simulation modelling. A research void is stated to be pollution and oil-spill control. There are no courses being conducted at either under-graduate or at post-graduate levels in disaster studies.



Natural Systems Research Pty. Ltd.  
Brascon House,  
25 Burwood Road, HAWTHORN. VIC. 3122 (03) 818 - 0264  
Telex AA 31585

General Information:

NSR was established in 1974 to provide research and consultancy services in the natural environmental sciences. Major areas of experience include environmental feasibility and impact studies for mining, port, industrial and resort/residential developments, socio-economic impact assessment, oceanographic and meteorological surveys.

- \* Mr Alastair Sharp-Paul Director
- \* Mr Stuart Jones, Director

Varied consulting experience in coastal and fluvial geomorphology, hydrogeology, economic geology, remote sensing, environmental impact assessment, design of environmental surveys, social psychology of remote industrial communities.

- \* Dr Thomas Beer, Associate

Dr Beer was formerly a Research Fellow at the Centre for Resource and Environmental Studies (CRES) at the Australian National University where his interests were in tropical cyclone studies and oil spill studies, including field work in order to simulate the effects of small scale oil releases. While at CRES he acted as a sub-consultant to NSR in the matter of oil spills and continues this work now as an associate of NSR. Other associates are:

- \* David Strachan, Geologist (project manager)
- \* Ian Hargreaves, Geomorphologist
- \* Ron Bouwhuis, Meteorologist

96.

NEW SOUTH WALES GOVERNMENT

NSW Department of Agriculture  
McKell Building  
Rawson Place, Sydney NSW 2000

(02) 2175076 direct

\* Mr Keith R McCloy  
Principle Officer, Remote Sensing

General:

Mr McCloy was previously a Senior Lecturer at the South Australian Institute of Technology at Ingle Farm, South Australia. While there he was involved in the monitoring of the status of environmental conditions by means of satellite image data from Landsat. Projects completed at the SAIT included:

- a. Estimating grassland conditions (greenness/brownness) and biomass for drought and potential grassfire monitoring.
- b. Monitoring of coastal change.

Mr McCloy also had an interest in the estimation of flood damage using remotely sensed imagery and models during the flooding process, and had liaised extensively with the Departments of Agriculture, Engineering and Water Resources, and the Country Fire Authorities of South Australia and Victoria.

Although still involved with remote sensing with the NSW Department of Agriculture his current work involves general agricultural surveys eg, state of grass, vermin problems, fire potential (but not flooding). His present contacts include the Centre for Remote Sensing at the University of New South Wales, the CSIRO Minerals Research Laboratories (Division of Mineral Physics, North Ryde), and the NSW Lands Department. Links are maintained with the Food & Agriculture Organisation of the UN, and the International Livestock Centre of Africa on mapping grassland conditions.

\* Max Humphreys,  
Traffic Authority of New South Wales,  
52 Rothschild Avenue,  
Rosebery.  
Box 110, Rosebery, N.S.W. 2018

(02) 663 0725

The Traffic Accident Research Unit has become increasingly aware of the similarities and lessons to be learned from disaster research and the road crash problem with which the Unit is concerned, especially from the psychological point of view. This is clearly described in a recent TARU report 2/81 published early in 1981. The report is entitled:

"Psychological and Social Losses from Road Traffic Crashes" and is available on request.

Phillip Institute of Technology  
Plenty Road  
Bundoora Victoria 3083

(03) 4682200

\* Mr Gary Gibson  
Head of Unit  
Seismology Research Centre

A network of eighteen seismographs is being used to monitor Victorian earthquakes. About two hundred and fifty events are being located each year, but most are too small or too deep to be felt. About ten earthquakes are felt in the State of Victoria each year. It is hoped that the seismograph network can be extended to provide improved State-wide coverage, and improved coverage in the Melbourne area. Most work of the Unit however is on a consulting basis for large engineering projects such as dam construction. Apart from earthquake monitoring as such there is also effort put into earthquake prediction and risk analysis. Mr Gibson has visited China twice, where much earthquake research is being conducted. The Centre also has extensive facilities for analogue and digital recording of earthquakes, for the replay of digital records, and for the interpretation of results. Most recorders however are located at the sites of specific engineering projects rather than to provide State-wide coverage. Computers are used for simulation, both for routine and research work. A need for future research work is seen in the installation of equipment optimised for the determination of stress direction and magnitude in the Melbourne area. It is suspected that there is a quite high stress drop on small local earthquakes. The Centre exchanges information with the equivalent organisations in other States such as the University of Adelaide, the University of Tasmania, the Queensland University and the Australian National University, and with the Bureau of Mineral Resources and the Queensland Department of Mines.

\* Also involved is Mr Vaughan Wesson, an engineering seismologist, who is working towards a Master of Applied Science degree in seismology. Contact is also maintained with the Victorian State Emergency Service which is kept informed of any unusual seismic activity.

98.

Phillip Institute of Technology  
Plenty Road  
Bundoora, Victoria 3083 (03) 468 2200

- \* Miss Margaret McKinnon  
Acting Head  
School of Nursing

The School of Nursing at this Institute conducts under-graduate course work in disaster studies. Students who undertake the three years Diploma of Applied Science in Nursing program study a course entitled "Nursing in Emergencies and Disasters". This course consists of twenty hours theory and demonstration. In addition, counter-disaster planning is seen as part of the management function, and some learning experiences in relation to this are included in courses offered to registered nurses. For instance, within the Bachelor of Applied Science in Advanced Nursing (Nursing Administration stream) there are four hours of theory on this topic, and a one day unit conducted at the Australian Counter Disaster College. Also a seminar is conducted as part of course studies. The roles and responsibilities of nurse administrators are emphasised, in particular, as related to planning and procedures within hospitals.

Higher degrees in nursing are not available in this country to interested graduates, and no disaster research is conducted in the School of Nursing although it is hoped that nurses may participate and contribute to research on this subject in the future. In this regard the level of academic preparation available to professional nurses within Australia is seen to be a significant constraint.

Queensland Institute of Technology,  
George Street, Brisbane  
GPO Box 2434  
Brisbane Queensland 4001 (07) 221 2411 Telex 44699

- \* Mr J P Corner  
Lecturer  
Department of Civil Engineering

Some rural traffic accident research has been carried out. There are no hazard-related courses at either under-graduate or post-graduate level.

- \* Mr C R Button  
Lecturer  
Department of Civil Engineering

Work has included studies on fasteners for timber structures. There is an undergraduate thesis on fasteners in progress, and commercial testing of fasteners is in progress. Mr Button is on a committee of James Cook University of North Queensland Cyclone Testing Station and is preparing an audio visual program on wind engineering for student use.

- \* Mr R G Black  
Senior Lecturer  
Department of Civil Engineering

Disaster-related interests include wind loads on buildings, flood level and discharge relationships, flood level prediction and local erosion (scour). There are no courses at under-graduate level in disaster studies as such, but there is traditional civil engineering "disaster prevention" analysis. Mr Black has worked with the Brisbane City Council on flood prediction.

100.

Queensland Institute of Technology  
George Street Brisbane  
GPO Box 2434  
Brisbane Queensland 4001 (07) 221 2411 Telex 44699

- \* Tom Heath  
Head, School of the Built Environment

The following brief note has been submitted for inclusion in this publication:

"For this School we do not have any on-going research or teaching programs related to natural and man-made disasters.

\* However Ms Vesna Popovic, Senior Lecturer in Industrial Design has worked in this area in connection with the International Study on Disaster Relief that was organised by the International Council of Societies of Industrial Design (ICSID), International League of Red Cross Societies and the United Nations Disaster Relief Organisation (UNDRO). During that time the following research projects were developed:

- a. A Natural Disaster First-Aid Emergency Unit
- b. A rescue kit for crushed limbs. (This work is done together with Prof Dr Branko Radulovic, Orthopedic surgeon).

Both projects were carried out from 1975 to 1979 in USA and Yugoslavia.

Royal Melbourne Institute of Technology  
124 La Trobe Street  
GPO Box 2476V,  
Melbourne Victoria 3000 (03) 345 2822 Telex AA 36406

- \* Dr J R Watkins  
Head  
Department of Geology

Dr Watkins has indicated, briefly, that he has disaster-related interests in earthquake prediction and landslide occurrence. There are relevant sections of courses in:

- a. Graduate Diploma of Engineering Geology
- b. Bachelor of Applied Science (Applied Geology)
- c. Master of Applied Science.

Royal Melbourne Institute of Technology  
 124 La Trobe Street, GPO Box 1476 V  
 Melbourne Victoria 3001 (03) 3452822 Telex AA36406

\* Mr P A Campbell  
 Principal Lecturer  
 Department of Civil & Aeronautical Engineering

#### Disaster-related research

Project A. The development of skills and information to reduce the losses to agriculture arising from wild fires.  
 (P A Campbell)

Project B. Investigations into the requirements for maintaining road and rail communications during and immediately after a disaster. (Dr H A Johansons who is also a Major.  
 \* Royal Australian Engineers)

Project C. Civil Defence shelters within or under, as well as separate from, existing structures (Dr H A Johansons; (This was to be a future research project at the time of receipt of this submission.)

Research voids relating to these various projects are seen to be as follows:

Project A. Most of the current information relates to what happens during and after a wild fire. There is almost no information on how to plan an agricultural system to become more resistant to wild fire losses and the technology is in much the same state as it was for earthquakes a century ago when it was considered impossible to design economical protective measures. It is clear that there are means of protecting agricultural hardware, stock systems but no one is charged with collecting such information and assigned the skills and resources to undertake this.

Project B. There is a need for abstracts related to planning aspects of maintaining communications during and after a disaster. A map showing the frequency of various disasters in Australia and their duration would be a prerequisite to designing systems for survival or recovery.

Project C. An abstract of references on shelter design should be available from civil defence authorities overseas to authorities in Australia for transmission to those concerned.

Funding constraints apply to all projects and so the amount of work which will be done will be very limited.

At under-graduate level flood analysis and cyclone design are taught as part of the normal course in Civil Engineering.

112.

FMIT (continued)

Design for extreme conditions is a standard part of any Civil Engineering course and will also be covered in post graduate work. The terms disaster or hazard would probably not be used because these are part of normal design. Civil Engineering Departments at Monash and James Cook have a lot of research expertise related to the effects of wind (qv).

Faculty of Military Studies (University of New South Wales)  
Royal Military College, Duntroon ACT 2600 (062) 666922

- \* Dr N J de Mestre, Senior Lecturer, Dept of Mathematics
- \* Dr E A Catchpole
- \* Dr D Anderson
- \* Mr T Parkes
- \* Mrs W Catchpole

This team of five scientists is involved in the mathematical modelling of bush fire spread using a computer. By incorporating the various factors (parameters) such as wind that affect bushfire behaviour into the computer model it is possible in principle to predict bushfire spread more accurately than by conventional means. The combatting of fires is thus made easier, and results in a cost saving. Joint work is carried out with both the CSIRO Division of Forest Research and the CSIRO Division of Plant Industry. Data incorporated into the computer model has been supplied to the Duntroon team by CSIRO as a result of controlled fire tests carried out in the Northern Territory.

There is also information exchange with the Australian National University Department of Biogeography, and the USA Forest Fire Service.



South Australian College of Advanced Education,  
Salisbury East, South Australia. 5109 (08) 258 3000

- \* Dr Dale C Paul  
Assistant Director (Academic)

There is interest in the general problems of disaster prevention and welfare intervention. There is under-graduate course work in a unit entitled:

"The Community Worker and Disasters"

This forms part of a course in an Associate Diploma in Community Work (Youth). Also involved in this work is

- \* Mr Stan Cameron Fox, Lecturer in Community Work.

Aspects of the course work are administration in disaster, public awareness for disaster, post-disaster welfare planning, psychological, sociological and behavioural characteristics, and aspects of man-made disasters; also enforced migrations and refugees. Research projects are part of the unit mentioned above to be carried out by students individually or in small groups. The College has links with the major welfare and relief organisations, and it is hoped to build up international governmental links.

Swinburne Institute of Technology,  
PO Box 218,  
Hawthorn, Victoria 3122 (03) 8198911

- \* Mr D I Phillips  
Senior Lecturer in Hydraulics  
Department of Civil Engineering

Research has been carried out in the calibration of flood detention storages. Research in this area has been done in association with the Dandenong Valley Authority, and the Melbourne and Metropolitan Board of Works. Consulting work in this area is also carried out as an ongoing activity. Probable short courses relevant to flood in Civil Engineering for 1983 will be:

- a. Urban Floodways and Detention, and
- b. Urban Pipe Drainage Systems.

Special resources used in research include computers for the mathematical modelling of flood detention and drainage.

Relevant Publication:

An Evaluation of the Performance of a Flood Detention Storage - Liverpool Road Flood Retarding Basin - by D I Phillips  
Dandenong Valley Authority, Technical Report No 15  
December 1980.

104.

Sydney Teachers College  
University of Sydney (Manning Rd)  
PO Box 63,  
Camperdown NSW 2050

- \* Mr Colin Davey  
Lecturer  
Department of Human and Environmental Studies

Interests relate to the monitoring of environmental hazards, especially relating to land-use planning. There is course work on the hazards of "people-environment" interaction, as well as natural hazards. The Applied Study component of the post-graduate Diploma of Education Studies (geography) has two studies under way on people-induced disasters.

Tasmanian State Government

Department of Mines (002) 30 8033  
GPO Box 124B  
Hobart, Tasmania 7001

- \* H Murchie, Director of Mines
- \* P C Stevenson  
Supervising Geologist, Engineering Geology

The Engineering Geology Section of the Tasmanian Geological Survey within the Department of Mines has for some ten years been concerned with the causes, control and prediction of urban landslides. To this end it has engaged in research in the geology, soil mechanics and geomorphology of the phenomenon. On this basis the State of Tasmania has enacted legislation to provide for the proclamation of "land-slip zones", and a zoning system has been evolved to achieve this on a scientific basis.

Mr Stevenson is the Australasian member of the Landslide Commission of the International Association of Engineering Geology.

Landslide is often omitted from the disaster field of study, perhaps because it is often slow-moving, but to those involved there is no doubt of its disastrous nature.

The University of Adelaide,  
Box 498 GPO, Adelaide, SA 5001 (08) 228 5333

- \* Dr M J S Hirst  
Senior Lecturer  
Department of Civil Engineering

Disaster-related research includes flood warning and mitigation together with train derailment studies (computer model). In 1981 there were two assistants working on train derailment studies, and six Master of Engineering Science students involved in flood estimation, both rural and urban. There is some under-graduate course work in disaster studies, and some liaison with the South Australian Engineering and Water Supply Department on "ad hoc" projects.

- \* A E Shields  
Registrar

The Registrar of the University of Adelaide made the following comment regarding disaster studies:

"While there are few projects specifically related to counter-disaster studies, the University recognises its responsibility to the community as a source of information, indeed many of its members work individually with relevant government authority in an advisory role."

106.

The University of Adelaide  
Box 498 GPO Adelaide SA 5001

(08) 228 5333

- \* Dr C R Twidale  
Reader  
Department of Geography

Dr Twidale's interests in hazard-related research includes soil erosion, which is non-traumatic but nevertheless very significant, and the study of floods in the Adelaide Metropolitan Area since 1836. The research relates to the public awareness and concern of floods and the conflicts arising from flood problem solutions (eg, who pays for flood mitigation action?).

The flood studies are carried out under contract from the South Australian Engineering and Water Supply Department. There are no courses conducted in disaster-related matters at undergraduate level, nor are there courses or seminars for post-graduate students or management personnel. A research void is seen in the requirement for more work to be done on soil erosion, landslips and the like particularly in relation to human occupation. Also involved in the flood research is:

- \* Dr D L Smith, an economic geographer.
- \* Nick Harvey, a Senior Teaching Fellow in the Geography Department, has studied flooding and storm surges in Queensland.

The University of Adelaide,  
GPO Box 498,  
Adelaide, South Australia 5001 (08) 2285333

- \* Kenneth A Brown BDS, FICD,  
Senior Lecturer in Forensic Odontology,  
Department of Oral Biology

Dr Brown has made the following contribution for inclusion in this publication:

"Following the establishment of the Forensic Odontology Unit in this University, specially funded by the South Australian Government, the Australian Federal Police provided funding for a research program which included projects relevant to disaster victim identification, as follows:

To develop for Australia internationally compatible odontological methods for mass disaster victim identification. Disaster victim identification at present is the responsibility of State government instrumentalities, and there is no standardisation or co-ordination of these procedures.

To develop computer programs for processing data provided on dental records and that obtained from post mortem dental material from victims of mass disasters.

The further development of a video system of cranio facial photo-superimposition as a means of identification, suitable for mass disaster victims.

The particular emphasis in these projects is directed towards disasters such as aircraft crashes and fires involving multiple victims.

My own opinion, based on study and observations in this field overseas, is strongly in favour of a centrally co-ordinated and standardised plan, with trained personnel available to function effectively at short notice. This requires considerable study and co-operation between the appropriate State authorities and the setting up of training programs.

This department offers regularly, short 3-day postgraduate courses on mass disaster identification for dentists, and candidates for these courses come from all mainland States and the three armed services."

108.

University of Canterbury  
Private Bag  
Christchurch 1, New Zealand 482 009

- \* Dr Arnold R Parr  
Senior Lecturer in Sociology  
Sociology Department

Dr Parr has supplied, very briefly, the following details of his interests in disasters:

- a. Sociology of Disasters
- b. Organisational Response to Disasters
- c. Formation of New Groups in Disasters
- d. Earthquake Prediction
- e. Earthquake Insurance
- f. Earthquake Restoration

University of Melbourne  
Parkville, Victoria 3052

(03) 345 1844

\* J B Potter,  
Registrar

Mr Potter has made the following comments in response to the disaster research survey:

"The Dean of the Faculty of Veterinary Science has advised that he would think it likely that the Faculty would be consulted in a technical capacity in circumstances of drought, bushfires or exotic disease. The Chairman of the Department of Community Health, Professor R Webster, has drawn attention to related aspects: one is the problem of storing cadavers while awaiting coroner's clearance. In this respect, the University's Medical School would probably have better facilities than any other institutions. Following the crash of the Air New Zealand DC 10, the Auckland Medical School was used in this matter.

The second aspect is that all medical students in the future will be qualified in First Aid and this would be an important resource in the event of any disaster.

In terms of constraints affecting research into hazards and disaster at the University, the principal constraints would be funding, and the provision of appropriate accommodation. It is also a fact that, in general, the research effort of the University is less applied in nature than would be necessary to produce specifically relevant results, except where funds are made available for a specific research project. This is not to say, of course, that the University's research effort does not from time to time make valuable contributions to the advancement of knowledge which would be useful for counter-disaster programs."

110.

University of Melbourne  
Parkville, Melbourne Vic 3052

(03) 345 1844

\* Dr I Douglas  
Senior Lecturer in Soil Science  
Soils Section  
School of Agriculture and Forestry

General:

Disaster-related research interest lies in the effect of herbicides and pesticides on soil biology. Course work at under-graduate level is conducted with reference to toxic pollution of the soil. Possible future research could involve a study of  $\text{NO}_2$  emissions from soil following the addition of nitrogenous fertiliser. A possible disaster research void is seen to be the pollution of soil by the application of animal wastes. Special resources being used include laboratory analyses of soils treated with herbicides. Other people involved in this research are:

\*\*\* Dr H Riazi, Mr P Fraser and Mr P Ebenbach

Relevant Publication:

Fraser PK and Douglas LA: Effect of Herbicides in Nitri-  
fication and Ammonification in a Mallee Soil.  
Proc. Soil Management Conference, Dookie 1981, pp 187-203.



University of Melbourne (03) 345 1844  
Parkville, Melbourne Victoria 3052.

- \* Professor A G Lloyd,  
Head, Agricultural Economics Group,  
School of Agriculture and Forestry

General:

Aspects of disaster research which have been  
studied include:

- \* a. Regional Income Stabilisation School  
(J Connell, Research Fellow, Economics  
Faculty of the University of Melbourne  
has also been involved in this work)
- b. Rainfall Insurance

There are no courses or sections of under-graduate  
courses, nor are there management courses or seminars devoted  
to disaster studies.

Studies for higher degree students relate to rural  
income stabilisation policies and strategies. Future research  
could possibly relate to simulation of operation of a rainfall  
insurance scheme.

Relevant publication:

Rainfall Insurance

Proceedings of Conference on Value of Meteorological Services  
Royal Meteorological Society of Australia; Melbourne 1979.

112.

University of Melbourne  
Parkville  
MELBOURNE VIC 3052

(03) 345 1844

Dr D G Parbery  
Dean and Reader  
School of Agriculture and Forestry

Research in this School is not directly related to disaster as such, However disaster-related aspects of under-graduate studies include:

1. Plant Pathology
2. Forest Protection (Fire, Pest and Disease Control)
3. Drought Feeding Strategies for Animals.

Courses, seminars, etc are not generally conducted for management personnel in disaster studies. However Agricultural Extension has done research on, and does give instruction in, how farms cope with disaster level financial crises. This also relates to counter-disaster planning, public awareness for disaster, and psychological and sociological aspects. It is envisaged that future hazard-related teaching subjects will include:

1. the management of stock during drought
2. the management of plants and animals during disease outbreaks
3. breeding plants for resistance to disease
4. other methods of disease control - plant pathology.

Fire control is an important subject in the Forestry Course, and all of the above will appear in new courses.

Constraints affecting research are seen to be insufficient funding, staff ceilings (there is no entomologist on the staff of the School), and too great a lack of technical staff which in turn leaves insufficient research time for research staff. A lack of high quality post-graduate students also exists through lack of support.

University of Melbourne (03) 345 1844  
 Parkville, Melbourne, Vic 3052

\* Dr B B Sharp  
 Chairman  
 Department of Civil Engineering

General:

Disaster-related research being carried out in this Department includes:

- a. Hydrology research
- b. Cyclone and earthquake resistant structural design
- c. Fire services, specifically in tall buildings.

This research has involved a number of the Civil Engineering staff. There is both under-graduate and post-graduate course work in aspects of hazard, namely:

- a. Flood mitigation
- b. Computer simulation models for flood damage prediction
- c. Computer simulation of problems causing pipe failures (in fire services and in petroleum product lines)
- d. Model representation for the effect of cyclones.

Future research will include the behaviour of structures loaded dynamically to the collapsed state, and water hammer studies, as well as a continuation of the above.

There are graduate students aspiring to higher degrees in disaster studies both in Civil Engineering and Agricultural Engineering.

A research void in disaster studies is seen to be the dynamic stability of structures. A restriction on research is the availability of research grants, currently around \$4,500, to graduate research engineers.

Special resources being used include computers, structural models, a "strong" floor, and a wave flume (artificial water channel for wave studies). There are contacts with Monash University (joint proposals) and the Department is represented on the National committee on Metal Structures, and has Committee Memberships on the Standards Association of Australia.

Publications: The Department of Civil Engineering has a considerable publications output in Agricultural Engineering, Hydraulic Engineering, Soil Engineering, Structural Engineering, Transport Engineering and Engineering Practices. Much of this output is disaster-related, and includes some

114.

seventy articles and reports for 1980 alone. An up-to-date list of research topics in progress, articles, reports, provisional patents, theses passed for higher degrees, theses in progress and substantial grants received is available from the Department of Civil Engineering on request.

The University of Newcastle  
Rankin Drive  
Shortland New South Wales, 2308

115.

(049) 680401

- \* Professor Beverley Raphael  
Professor of Psychiatry,  
Faculty of Medicine

Professor Raphael's research interests include psychiatric aspects of natural and man-made disasters, including preventive programs aimed at reducing post-disaster morbidity in victims and helpers. Under-graduate courses of instruction in disaster studies are given with reference to psychological, sociological and behavioural aspects, and some seminars have been run for psychiatrists.

Future research relating to hazards or disasters relates to the setting up of a framework for assessing psychiatric vulnerability in disaster. Also there is need for studies into "chronic" or lasting disasters such as drought which have no research in the social/behavioural sphere.

Professor Raphael is also a consultant to the Commonwealth Government on psychiatric aspects of disasters for the Royal Australian and New Zealand College of Psychiatrists. Other contacts include groups studying disaster in New Zealand, and other psychiatrists generally, eg, the Social Psychiatry Research Unit at Canberra.

- \* Dr B Singh, Senior Lecturer in Psychiatry, is also involved in this work.

#### Publications by Beverley Raphael:

A primary prevention action program: Psychiatric involvement following a major rail disaster. *Omega*, Vol 10(3) 1979-80.

The Granville train disaster: Psychological needs and their management. *Med. J Aust*, 1977, 1:303-305.

Disasters and health: The longer term impact of natural disasters, especially flooding on health. Paper presented at Australian Water Resources Council Floodplain Management Conference, Canberra, 7-10 May 1980.

The preventive psychiatry of natural hazard. Paper presented at Symposium on Natural Hazards in Australia, Academy of Sciences, Canberra, 26-29 May 1976. In 'Natural Hazards in Aust', Ed J Heathcote 1977. Who helps the helpers? - The effects of a disaster on the rescue workers. Paper submitted for publication - *Omega*, 1980.

Disaster - The helper's perspective. *Med J Aust* 1980, 2:445-447.

Report on National Disasters. The Australian and New Zealand College of Psychiatrists' Bulletin, 1979.

116.

University of New England  
Armidale NSW 2351

(067) 733333

\* Dr J E Hobbs  
Senior Lecturer  
Geography Department

(067) 732903 direct

Natural Hazards Teaching and Research in the Geography  
Department:

The departmental interest in natural hazards extends well back into the 1960s. Early interest was mainly at the research level, particularly in relation to flooding, but various aspects of natural hazards have always received attention in several undergraduate courses.

Undergraduate course in Natural Hazards

A second year one semester undergraduate course in Natural Hazards has been offered since 1977. The course was initiated at a time of growing concern about natural hazards, partly in response to student demand, partly in response to a perceived need to diversify course offerings, and partly to make better use of available staff interests and expertise. In addition, the course is viewed as a small contribution towards broader education of the community at large about natural hazards, particularly concerning questions of awareness and preparedness. It seems to be popular with students and provides the opportunity for many valuable exchanges of ideas and information, since many of the students have first-hand experience of hazard situations. This has proved to be the case especially with the external students, some of whom are members of State Emergency Services or other organisations concerned with handling natural hazards.

The course is presented as a team effort by several staff members, each concentrating upon his own area of expertise. Assessment includes an individual research report, for which students are expected to make a study of a hazard event or type, or of the hazard liability of an area. Critical analysis is expected as well as straightforward description. So far about 250 such reports have been submitted covering just about every conceivable aspect of a wide range of hazards. Practical work includes simple statistics of extreme events, a tropical cyclone 'simulation' which requires students to develop action plans given reasonably realistic sets of conditions, and a set of bush-fire exercises.

The approach in the course is deliberately broad, covering a wide range of topics and including physical characteristics and human responses. Topics covered include biological hazards, bushfires, atmospheric hazards, floods, droughts, landslides, volcanoes, earthquakes, coastal hazards, awareness and perception of hazards, decision-making and adjustment, and the role of government.

Course content is currently under close examination and some restructuring is likely over the next year or two. In particular, it is hoped to incorporate material and ideas collected during a recent period of study leave in the USA, and the emphasis will probably shift towards the human response side, away from physical characteristics.

Student reaction to the course has been good, to the extent that serious consideration is being given to the introduction of a follow-up third year course in natural hazards. While this is still some way off, it seems likely that any such course would provide the opportunity for individual students to specialise to a limited extent in areas of special interest.

There is also some hope that in future it might be possible to make any natural hazards course available to interested people outside the University - perhaps to members of local government organisations, perhaps to insurance representatives, perhaps to members of State Emergency Services. Such a development would be viewed as a community service, helping to meet what seems to be a serious lack of awareness in the community at large.

The present course has attracted considerable interest from other departments around the world thinking about establishing similar courses. The notes routinely prepared for external students have been widely disseminated to assist the development of such courses.

#### Research and Publications

The items listed below give some idea of the past research interests within the department:

Alchin CC et al (1976): A study of the perception of drought and adopted drought strategies in the Wellington area of NSW. *Geoview*, 1, 3, 1-15.

Bellamy C (1980): A regional appraisal of methods of reducing the bushfire hazard in Australia through the use of aircraft. *Geoview*, 5, 1, 52-62.

Davies TD and Lee KW (1968): An economic appraisal of flood mitigation works on the Macleay floodplain. Research Series in Applied Geography, 9, Geography Dept UNE.

Deitch, LI (1973): Perception of the arid environment: a case study of American and Australian urban arid land residents. Unpubl PhD thesis, Geography Dept UNE.

Douglas I (1979): Flooding in Australia: a review. In *Natural Hazards in Australia* (eds R Heathcote and B Thom), Australian Academy of Science 143-163.

Douglas I and Hobbs J (1974): Deluge in Australia. *Geographical Mag.* 46, 9, 465-471.

Douglas I and Hobbs J (1979): Public and private reaction to three flood events in northwestern New South Wales 1971-1976. In Natural Hazards in Australia (eds R Heathcote and B Thom) Australian Academy of Science 251-259.

Fitzgerald LJ (1976): Penalties incurred when expanding agriculture into regions that have inadequate moisture. Geoview, 1, 4, 33-40.

Hobbs J (1980): Three tropical cyclones in five weeks in Western Australia. J. of Met, 5, 50, 170-173.

Irby PA (1972): Flood hazard perception and adjustment in the Lower Tweed River Valley. Unpubl BEc Hons thesis, Geography Dept UNE.

Lawson SW (1978): Tropical cyclone hazards and loss mitigation on the Gold Coast, Queensland. Unpubl BA Hons thesis, Geography Dept UNE.

Lee KW (1969): A report on the investigation and findings of the University of New England on the hydrological and economic results of flood mitigation works in the Macleay valley, and the possible extension of the role and functions of the Macleay River County Council. Research Series in Applied Geography, 26, Geography Dept UNE.

Maxted, KC (1978): Perception of the tropical cyclone hazard on the Queensland Gold Coast. Unpubl BA Hons thesis, Geography Dept UNE.

McClelland, H (1980): A severe local storm at Nundle NSW. November 1979. Geoview 5, 2, 37-45.

McDonald GT (1967): A report on the hydrological implications of flood mitigation work on the floodplain of the Macleay valley below Kempsey. Research Series in Applied Geography, 9, Geography Dept UNE.

McDonald GT and Lee KW (1968): An economic appraisal of flood mitigation works on the Macleay floodplain. Research Series in Applied Geography, 10, Geography Dept UNE.

Nash SA (1979): The locust plague threat in Central Western NSW - spring 1979. Geoview, 4, 2, 1-15.

Payne RJ (1972): Decision-making under conditions of environmental stress: a case study in the Hunter Valley, NSW. Unpubl MA thesis, Geography Dpt UNE.

Payne RJ and Pigram JJ (1973): Modelling human response to natural hazard: a theoretical investigation. Occasional Paper 3, NSW Geographical Society, Geography Dept UNE.

Pidcock ML (1968): Catchment control for prevention of floods in the Clarence River Valley. Unpubl BA Hons thesis, Geography Dept UNE.



Swan SC StC (1975): The coast erosion hazard in South West Sri Lanka: a reconnaissance study. Research Series in Applied Geography, 40, Geography Dept UNE.

Current research interest in the Geography Department related to natural hazards include:

- severe local storms in Australia
- the synoptic climatology of Australian droughts
- the hazards posed by climatic fluctuations in climatically marginal areas
- education for hazard awareness and preparedness.

120.

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\* Dr F C Bell, BSc (Sydney), MSc, PhD,  
Senior Lecturer in Physical Geography,  
School of Geography  
Faculty of Applied Science

Disaster-related research has involved studies in the long-term probability estimation and short-term deterministic forecasting of extreme flood levels, wind speeds and similar phenomena. Also the aspects of environmental impact assessment relevant to potential hazards and disasters. As an Applied Mathematician and Hydrologist Dr Bell has been involved in these areas with numerous other people at the University of New South Wales, the Colorado State University in USA, the Institute of Hydrology in the UK, and the University of East Anglia in the UK, over a period of about 20 years.

Dr Bell presents lectures in sections of five under-graduate subjects and two graduate subjects that are concerned with the analyses, prediction and significance of natural hazards and extreme events.

There are no courses or seminars specifically at management level in disaster studies although sections of graduate courses in Meteorological and Hydrological Principles and Geomorphology for Hydrologists are relevant, and the students in these courses may include management personnel. Aspects of courses are concerned with flood mitigation measures, public awareness, computer modelling, and the environmental impact assessment relevant to natural hazards and disaster vulnerability. There are no graduates aspiring to higher degrees who are working on disaster studies, but several higher degree studies have marginally relevant aspects such as the effects of extreme floods on river channels, and air pollution potential under extreme atmospheric conditions.

Dr Bell has published at least twenty paper on extreme flood estimation and forecasting but most of these were prior to 1970; some of his recent work in this area has been presented at meteorological and hydrological seminars or symposia but not in forms suitable for publication. Future research should include options for studying natural hazards and disaster potential. Such options should be increased and broadened in the Applied Science Faculty's undergraduate courses; further research is likely to be carried out by Dr Bell himself and possibly some graduate students, on improved techniques for estimating hazard probabilities, and on aspects of environmental impact assessment relevant to natural hazards and disaster vulnerability.

Research voids are seen to be the following:

- a. the gross unreliability of current techniques of estimating hazard probabilities, and the practical significance of the resulting uncertainties;
- b. application of ergodicity concepts for improving the reliability of hazard probability estimation; and
- c. vulnerability of large residential and industrial complexes to modern weaponry in the event of war.

Responding personally, Dr Bell finds that the main constraint in his research is lack of time. The research that he wishes to pursue involves creative analysis of a type which cannot be delegated to others or benefit from paid assistance. It is not possible for him to find the required uninterrupted time for such work and concurrently perform his expected academic duties.

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\* Mr R D Munro  
Senior Lecturer  
Department of Transport Engineering  
School of Civil Engineering

Although depending on the definition of disaster, this Department has reported that it conducts studies into traffic accidents. Projects completed include some case studies: analysis and economic aspects of road accidents; relation of pedestrian trauma to vehicle design; relation of road accidents to street lighting; traffic conflicts (further details can be supplied on request). Future work will relate to an ongoing concern with the traffic accidents area. There are no courses conducted, nor are there any higher degree students working in this field in the School.

Others who have been involved in this area are:

- \* Professor W R Blunden (retired)
- \* Mr H J Turner (also retired)
- \* Dr A J Fisher
- \* Mr J I Tindall

122.

University of New South Wales  
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- \* Associate Professor A P Kabaila,  
Acting Head  
Department of Structural Engineering

Hazard research is related to structural failures of bridges, buildings and industrial installations. Other members of the Department who have been involved are:

- \* Dr B V Rangan, Associate Professor
- \* Dr D Fraser, Senior Lecturer
- \* Dr P Kneen, Senior Lecturer
- \* Dr A Heaney, Senior Lecturer
- \* P Balint, Senior Lecturer

Courses are conducted at under-graduate level in disaster studies. Graduates aspiring to higher degrees have been involved in analytical studies, and experimental studies of reinforced concrete.

Projects completed are published as a number of UNICIV reports and other papers.

Future research will be a continuation of present work, and research into off-shore structures, particularly oil rig failures.

Special resources being used are computers for simulation, and structural testing facilities, including a reaction floor which is the largest in Australia.

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Kensington, NSW 2033

(02) 6630351

- \* Professor Lloyd E Smythe  
Head, Department of Analytical Chemistry and  
Chairman, School of Chemistry Safety Committee

Short courses on fire, explosion, chemical hazards, toxic hazards to research workers and post-graduate students are conducted in the School of Chemistry. Also preventative measures and action. No research as such is carried out in these matters, but information is updated and safety bulletins are issued. New academic and technical supervisory staff are included in regular short courses (aspects of disasters applicable to chemical laboratory work - teaching and research), and nine safety bulletins on specific aspects have been issued. Although no research is conducted, new planned research projects are seen to be required in this area.

Questionnaires are issued for completion after each incident and these are separately assessed or considered by the Head of the School, and the Safety Committee. The School of Chemistry conducts the following hazard-related course:

2.251G Toxicology, Occupational and Public Health.

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- \* Dr Colin F Pain  
Lecturer  
School of Geography

Disaster-related interests are potential land-slide hazards. There is under-graduate course work in slope stability and landslide potential, but there are no courses, seminars etc at management personnel level.

- \* G Luscombe, a fourth year honours student of 1981 has also been involved in this work.

There has been co-operation with the Papua New Guinea National Planning Office on landslide potential in the Papua New Guinea highlands.

124.

The University of New South Wales  
PO Box 1 Kensington, NSW 2033 (02) 663 0351

- \* Professor N L Svensson  
Dean, Faculty of Engineering

A proposal is being developed for a Master of Safety Science program. This program is mainly directed to the field of occupational health and safety but it will include subjects which may be of interest to those involved in counter-disaster research activities. The subjects are the Accident Phenomenon, Management for Safety and a series of safety engineering electives. These subjects will be supported by others dealing with the structure and function of the human body, Law for Safety, Principles of Management, Psychology and Ergonomics.

- \* Professor F F Roxborough, Head, School of Mining Engineering, and
- \* Dr H R Phillips, Senior Lecturer in Mining Engineering.

Hazard research includes coal dust explosions in mining.

Undergraduate course material comprises safety in coal and other mines, gas and dust ignitions, and geomechanics. More specifically these courses relate to methane and dust explosions, mine rescue, the geomechanics of roof support in mines, mine stability and precautions against inrushes. There are two (new) post-graduate projects relating to potential disasters:

- a. methane desorption from coal seams, and
- b. spontaneous combustion in coal-mining operations.

Future research is seen to be related to the development of safety in coal mines, Special resources being used include computers and gas analysis and dust measuring equipment.

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- \* Tom G. Chapman,  
Professor of Civil Engineering and  
Head, Department of Water Engineering

Hazard related research in this Department includes

1. flood and drought prediction and estimation
2. flood plain management
3. coastal engineering - wave action and breakwater stability
4. occurrence and control of oil spills at sea

Staff involved in such research are

- \* Associate Professor D H Pilgrim - flood prediction and estimation.
- \* Associate Professor I Cordery - drought forecasting
- \* Associate Professor D T Howell - flood plain management
- \* Associate Professor D N Foster - coastal engineering  
and other academic, professional, and support staff.

Parts of the following subjects in the Bachelor of Engineering Course in Civil Engineering have disaster-related content:

- 8.582 Water Resources II (core subject)
- 8.020 Hydrology

Also there is an annual three month graduate course in Hydrology which covers flood estimation and flood plain management: short courses on other relevant subjects are offered occasionally. There are graduates aspiring to higher degrees in all the topics listed above. Special resources being used includes computers and simulation models. A research void is seen to be in regard to hazards due to accidental release of liquid pollutants such as sewage, agricultural and industrial effluents.

126.

University of New South Wales  
Department of Water Engineering (continued)

There are normal exchanges with other universities and institutes of technology, co-operation with other organizations through the National Committee on Hydrology and Water resources, and the National Committee on Coastal Engineering, of the Institution of Engineers, Australia. There are also links with the Australian Water Resources Council, the Australian National Committee on Large Dams, the National Committee on Hydrology of the Australian Academy of Science, and the UNESCO International Hydrology Program.

The Water Reference Library at Manly Vale exchanges publications with over two hundred overseas establishments.

Publications:

A list of papers can be abstracted from the University of New South Wales' annual research and publications report, given a start time (e.g., all papers in the last five years, ten years, etc.).



University of Queensland,  
St. Lucia. Queensland. 4067 (07) 377 1111

- \* Edna Chamberlain, Professor of Social Work
- \* John Western, Professor of Sociology
- \* Patricia Short, M.A. thesis on the reaction of Brisbane flood victims to their experiences.

Although past work has been carried out in the areas of floods and cyclones there is no future research or teaching projects envisaged. Funding and staff ceilings make the continuation of a viable group virtually impossible to sustain.

Publications:

Biernoff, D.C. and Western, J.S. (1976), Social Needs and the Moreton Region. Canberra: Australian Government Publishing Service.

- \* Milne, Gordon (1977) Cyclone Tracy: (1) Some Consequences of the Evacuation for Adult Victims. Australian Psychologist, 12 (1): 39-54.

Milne, Gordon (1977), Cyclone Tracy: (a) The Effects on Darwin's Children. Australian Psychologist, 12(1): 55-62.

Short, P. (1979), 'Victims' and 'Helpers', in Heathcote, R.L. and Thom, B.G. (eds), Natural Hazards in Australia. Canberra: Australian Academy of Science.

Western, J.S. and Milne, Gordon (1979), "Some Social Effects of a Natural Hazard: Darwin residents and Cyclone Tracy", in Heathcote, R.L. and Thom, B.G. (eds), Natural Hazards in Australia. Canberra: Australian Academy of Science.

Western J.S. and Doube, L. (1970, "Stress and Cyclone Tracy" in Pickup, G. (ed.), Natural Hazards Management in North Australia, pp. 374-402. Canberra: A.N.U. Press.

Short, P. (1977), "Family is Familiar". Paper presented at the Australian Conference on Crisis in the Family, Brisbane, May.

Western, J.S. (1980). "Caring for the community in disaster situations: the short-term aspects", in Oliver, J. (ed.), Response to Disaster. Townsville: James Cook University.

Short, P. (1980), "Sociological Aspects of Flood Plain Management". Paper delivered at Flood Plain Management Conference, Australian Water Resources Council, Canberra, May.

Chamberlain, E.R. (1980), "The Welfare Experience in Disasters". Proceedings of Welfare Administrators' Seminar, 23-26 June. Macedon: Australian Counter Disaster College, Department of Defence, 1980, pp. 12-22.

Chamberlain, E., Doube, L., Milne G., Rolls, M. and Western, J. (1981), The Experience of Cyclone Tracy. Department of Social Security. Canberra: Australian Government Publishing Service.

Chamberlain, E.R., Hartshorn, A.E., Mugglestone, H., Short, P., Swensson, H. and Western, J.S. (1981), The Queensland Flood Report - Australia Day 1974. Department of Social Security. Canberra: Australian Government Publishing Service.

University of Queensland,  
St Lucia, Queensland, 4067

(07) 3371111

- Dr J Price  
Reader & Head of the Department of Psychiatry

Dr Price is interested in the psycho-social aspect relating to disaster and is currently the only person in the Department working in this area. There are no courses of instruction to under-graduates but Dr Price has taken part in a number of workshops in this field on an irregular basis. Also there are no higher degree aspirants. Future work will include:

- a. completing a booklet on "Psychosocial Aspects of Disaster" being prepared in collaboration with Professor Beverley Raphael of the University of Newcastle (qv);
- b. a project under consideration relating to the preparedness of potential bush-fire victims.

Dr Price sees as a research void the need for consultants to be available for people with expertise in disaster studies to enable them to go on site in future disasters to monitor and report on the disaster response essentially as observers.

The Department of Psychiatry has worked in collaboration with State Emergency Services, the Department of Social Security and the Department of Sociology (University of Queensland) in producing pamphlets. There is also some correspondence with James Cook University of North Queensland (Professors Oliver and Kearney qv).

#### Publications relevant:

Abrahams, MJ, Price J, Whitlock FA and Williams G (1976) The Brisbane floods, January 1974: their impact on health. *Medical Journal of Australia*, 2: 936

Price J (1978). Some age-related effects of the 1974 Brisbane floods. *Australian and New Zealand Journal of Psychiatry*, 12: 55.

Personal distress and natural disaster: A pamphlet for volunteers. Prepared in Queensland by a Committee convened by the Royal Australian and New Zealand College of Psychiatrists. 1979.

Personal distress and natural disaster: A pamphlet for community leaders. Prepared in Queensland by a Committee convened by the Royal Australian and New Zealand College of Psychiatrists. 1979.

130.

DOUBLE ENTRY

University of Queensland,  
St. Lucia, 4067

(07) 377 1111

\* Mr. D.P. Doessel  
Lecturer in Economics

North Brisbane College of Advanced Education,  
P.O. Box 117,  
Kedron. Queensland. 4031

(07) 577 077

\* Mr J.R.G. Butler,  
Lecturer in Economics

Messrs. Doessel and Butler do not conduct courses in disaster studies in their respective Departments, but their interests lie in the efficiency and the equity in natural disaster relief. The reader is referred to their joint publication:

"The Economics of Natural Disaster Relief  
in Australia"

J.R.G. Butler and D.P. Doessel

Centre for Research on Federal Financial Relations

The Australian National University, Canberra

Research Monograph No. 27 1979

The University of Sydney (02) 6921122  
 Sydney NSW. 2006.

\* Dr David Chapman (02) 6923364 direct  
 Lecturer  
 Coastal Studies Unit  
 Department of Geography (H03)

General:

This unit has been involved in coastal hydrodynamics and morphodynamic changes, and includes dune and sediment changes, and coastal ecology (work relating mainly to Australia). Although the effort has not been directly disaster-oriented, there is a hazard related component, namely coastal erosion. Future research is seen to be related to costs and benefits of coastal erosion management strategies.

\* Ms B Langton, an MA student, is currently researching coastal erosion policy. Dr Chapman would like to see some work done on the evaluation of the effectiveness of emergency and counter-disaster programs, ie he identifies this as a void in disaster research. There are informal contacts at professional level with other tertiary institutions and workers in Government Agencies. Also there are links with the Natural Hazards Research Center at the University of Colorado, the US Army Corps of Engineers, the Virginia Institute of Marine Science, and the Coastal Studies Unit at the Louisiana State University.

References:

Chapman, D M

Shore protection Options, pp 02.1 - 02.11 in Proceedings of the National Workshop on Coastal Management.  
 1981. RAIPR, Canberra

Chapman, D M

Directions in Shore Protection Management, pp 53-71 in Perspectives on Resource Management and Planning in Australia. O'Rourke, B (Editor) Sydney, Department of Geography, University of Sydney. 1981.

132.

University of Sydney  
New South Wales 2006

(02) 692 1122

\* John, M Bennett  
Professor of Computer Science,  
Basser Department of Computer Science,  
Madsen Building, PO9

Professor Bennett is not involved in disasters,  
but is included in this publication because he has  
interests which have counterpart relevance to organisational  
and human aspects of disaster.

At the ANZAAS Congress held in May 1982 at Macquarie  
University, Professor Bennett gave an invited talk\* in  
which he emphasised that when a project does not work out  
as expected the cause is usually not in the technique of  
managing small teams, as much of the software engineering  
literature implies. Usually the problems with computing  
projects are much the same in general character as with  
large engineering projects since the Tower of Babel. In  
this regard Professor Bennett has found the disaster  
literature a fruitful source of information on pointers of  
organisational and human problems which have considerable  
relevance to fiascos in the computing field.

- Large Computer Project Problems and their Causes  
John M Bennett  
52nd ANZAAS Congress, Section 41, May 1982

University of Waikato,  
Private Bag,  
Hamilton  
New Zealand.

- \* Ericksen, Dr. Neil J,  
Senior Lecturer, Department of Geography

Disaster-related research includes

- \* flood hazard (national policies for loss reduction and implementation at community level, also hazard and choice perception).
- \* seismic and volcanic hazard at Rotorua.

Several graduate students have been involved with this work. Under-graduate course work in hazard studies includes

- \* Environmental Geography (first year; five hours of lectures)
- \* Environmental Hazards: Human Ecology of Natural Hazards (second year - 1983)
- \* Natural Hazards Research (with particular reference to New Zealand - fourth year)

There are no seminars etc. conducted for management personnel, but the research on floods is being done for the National Water and Soil Conservation Organization (NWASCO) at Wellington for management purposes.

Graduates working towards higher degrees are

- \* Harbour, R (seismic volcanic activity in Rotorua)
- \* Armstrong, D (flood damage curves for Paeroa)
- \* Graham, M (Flood hazard and choice perception in Paeroa)

Possible future research relates to long term adjustments to various natural hazards in New Zealand. A research void is seen in the use of user-related resources to provide information on hazards; for example, hazard maps for land-use planning.

Special resources being used include computers, simulation models, and questionnaire surveys.

134.

Others involved in aspects of disasters and hazards in New Zealand are the following:

- \* Dr. Terry Healy,  
School of Earth Sciences,  
University of Waikato (coastal erosion)
- \* Dr. Ian Owens,  
Department of Geography,  
University of Canterbury,  
Christchurch, 1, New Zealand (landslip and avalanche)
- \* Dr. Michael Crozier,  
Department of Geography,  
Victoria University of Wellington,  
Private Bag,  
Wellington. New Zealand (landslip hazards)



The University of Wollongong (042) 297311  
 PO Box 1144  
 Wollongong NSW 2500

- \* Dr Stuart Piggin  
 Senior Lecturer in History  
 Department of History

General:

Dr Piggin is an historian and not a social scientist, but for a number of years he has been making a study of the human responses to mine disasters. In 1977 he visited the Disaster Research Center in Columbus, Ohio, under the directorship of Dr Quarantelli. He has since been involved in two Australian Broadcasting Commission programmes on religion and disaster. He is currently involved in making a television documentary comparing the Mt Kembla and Appin mine disasters.

- \* Mr Donald Dingsdag, a Ph D student, is researching technological change in the mining industry. His honours thesis (1980) is entitled "Responses to the Bulli Colliery Disaster of 1887 with special reference to the NSW Government and the Bulli Coal Mining Company".
- \* G Mitchell, mentioned below as co-author, was formerly a Ph D student in the History Department, but has now left the University.
- \* F Roberts is no longer at Wollongong University, but
- \* R Horne is with the University's Department of Sociology.

Publications:

Published articles on the Mt Kembla Disaster are:

- a. G Mitchell and S Piggin, "The Mount Kembla Explosion of 1902: Towards the Study of the Impact of a Disaster on a Community".  
Journal of Australian Studies, No. 1 June 1977,  
 pp. 52-69
- b. F Roberts and R Horne, "In Search of a Legend : an Australian Mining Village's View of its Past".  
Journal of Australian Studies, No. 4, 1979,  
 pp. 70-85

136.

University of Wollongong (contd)

- c. S Piggin, "Religion and Disaster: Popular Religious Attitudes to Disaster and Death with special reference to the Mt Kembla and Appin Coal Mine Disasters".

Journal of Australian Studies, No 8 1981, pp 54-63

At a conference in Wales in 1981 Dr Piggin read a paper entitled "The Death Imprint: Coping with the Memory of Disaster", which has not been published. He is currently writing a monograph on the Mt Kembla disaster.

Victorian State Government  
Department of Planning  
150 Queen Street  
Melbourne, Vic. 3000 (03) 6029236

137.

\* Ms. Wendy Morris  
Town Planner  
Rural Services Section

General:

Hazard related work of the Rural Services Section includes mapping techniques for planning purposes in relation to bushfire, flooding and geological hazard. The work, therefore, seeks to optimize land capability. The section has numerous research contacts with other State Government organizations, especially the Country Fire Authority - Victoria (qv), the Soil Conservation Authority, the State Rivers and Water Supply Commission, and the Department of Minerals and Energy. Courses of instruction are not conducted but several "guest" lectures are given each year to Planning students. Also techniques are taught to Regional Officers of relevant Government Departments. Co-operation with other organizations is very much integral to the conduct of most mapping exercises, and the Section works closely with local councils in implementing results into planning controls. There is limited exchange with overseas organisations because the scope of the Section's work is local, i.e., in a State-wide context. Special techniques involve the tapping of local knowledge and systematizing it into state-wide scales or ratings. Constraints affecting the work of the section are seen to be staff ceilings and priorities.

Publications:

Rural Mapping Guide

Mapping as a Basis for Planning Controls  
- a manual for rural municipalities

Department of Planning, Melbourne, Victoria, April 1981

\* \* \* \* \*

Bushfire Protection for Rural Houses

Design and Siting Guidelines (1980)

Town and Country Planning Board (now the Department of Planning) and Country Fire Authority  
150 Queen Street,  
Melbourne, Vic. 3000

(this booklet presents ideas on siting, design and landscaping rural properties to maximize protection from bushfires and is available from the Department gratis on request), \* \* \* \* \*

Bushfire Protection in Rural Areas and Small Towns -  
a Planning Guide  
Department of Planning and Country Fire Authority

138.

Western Australian Government

- \* Dr. Derek Alan Pocock,  
Forensic Pathologist,  
The State Health Laboratory Services,  
Public Health Department of Western Australia  
The Queen Elizabeth II Medical Centre, Nedlands WA,  
GPO Box F312, Perth. 6001 (09) 380 1122

The nature of the work being undertaken relates to the forensic pathology of the dead victims of any disaster involving identification and medico-legal procedures. There is some research being undertaken in stress reaction of potential disaster workers. Others involved in this work are

- \* Dr. J. M. N. Hilton, also of the State Laboratory Services and
- \* Dr. A. A. A. Landauer of the University of Western Australia. Dr Pocock sees a need for an "all-Australia" co-ordinated plan for the use of personnel when multiple fatalities occur in any one disaster. At present there is good liaison with Police and University Practitioners in medical and non-medical areas.

Bendigo College of Advanced Education  
PO Box 199  
BENDIGO VIC 3550 (054) 439433 direct

- \* Dr Trevor Arnold, Head, Department of Physical Education & Recreation.

General:

Although the Bendigo CAE has the staff with the interest and expertise to undertake research into hazards and disasters, no such research is carried out. However this College does conduct a course entitled, "Associate Diploma in Outdoor Education" which contains two subjects related to safety.

These are:

1. "First Aid and Safety", the aims of which are to develop an awareness of sound judgement and the recognition of danger through experience in potentially hazardous situations, to provide students with the necessary skills to enable them to administer first aid treatment to the sick or injured, and to develop the skills necessary for the safe evacuation of patients in situations of emergency.
2. "Safety and Rescue Techniques", the aims of which are to provide outdoor educators with the knowledge and skills to experience and recognize hazardous situations and the associated precautions, to equip outdoor educators with a sound knowledge of the prevention and treatment of the effects of exposure, and to train outdoor educators in the practice and organization of search and rescue techniques.

There is a close association with the Bendigo Branch of the Victorian State Emergency Service, and the Regional Officer of this Service gives guest lectures to the College and organizes exercises.

140.

NON-RESEARCH ANNEX

\* Air Vice-Marshal W Carter  
International Disaster Consultant  
'Blue Range'  
Macedon Victoria 3440 Tel: (054) 261611

Current Activities (1978-1982)

International Disaster Consultant, mainly in the fields of disaster analysis, counter-disaster planning and disaster preparedness.

Assignments carried out in Australia, Bangladesh, Burma, Fiji, Indonesia, Philippines, Solomon Islands, Tonga and USA.

Reports compiled include:

Report on Proposed Disaster Research and Training  
Centre in the Philippines  
Report on Provincial Disaster Preparedness in Indonesia  
National Disaster Plan, Solomon Islands  
Provincial Disaster Planning Guide, Solomon Islands  
Report on Cyclone Isaac, Tonga 1982  
Report on Disaster Preparedness in the South Pacific  
Region  
National Disaster Plan, Tonga  
Guidelines for Disaster Preparedness and Response, Tonga  
Counter-Disaster Training in Developing Countries

Disaster-Related Background Experience

Director, Australian Counter Disaster College 1969-1978

Various studies involving effects of nuclear weapons and related civil defence measures. notably as member of Prime Minister's Secretariat, London.

Experience in severe civil unrest situation, Palestine  
1945-1948

Additional Information

Patron of Australian Institute of Emergency Services

Advisory Roles with:

Australian Overseas Disaster Response Organisation  
Centre for Information and Research on Disasters  
and Natural Hazards (Australia)  
Pacific Islands Development Program (Hawaii)  
University of Wisconsin (USA)

Mrs E Ruth Dalitz  
Honorary Secretary  
Natural Disasters Action Committee  
21 Ponds Drive  
LARA Victoria 3212

NON-RESEARCH ANNEX

(052) 821648

THE OBJECTS OF THE NATURAL DISASTER ACTION COMMITTEE •

- a. To lobby to have legislated consumer protection for all land purchases, leases and rentals in all States and Territories; to cause to have all planned and future development in and on high risk areas stopped - eg flood plains, sand dunes, filled land, etc. unless adequately engineered; to have suitable building codes established for each specific area - eg "cyclone proofing" in areas subject to tropical cyclones; reasonable insurance available to householders and homeowners; primary producers disaster schemes; reimbursement to public authorities for expenditure necessitated by disasters; research into all aspects of disasters and the mitigation of all types of disasters and hazards caused by nature or man-induced.
- b. To lobby to have legislation passed in all States and Territories setting out legal responsibilities of original land owners, Local Governments, Developers, Real Estate Agents and others when subdividing land, selling land with or without buildings; giving warning in writing of any old quarries, mines or pits, the possibilities of inundation (flooding), high seas (high water), tsunamis (tidal wave), erosion (by sea or other causes), subsidence, tropical cyclone, storm surge, land-slide, earthquake, etc., to all prospective purchasers or tenants so that any inherent dangers or nuisance or disadvantages which may affect the land or persons using it, are made known prior to any contract being entered into.
- c. To lobby to have legislation passed in all States and Territories to impose strict standards on all planned and/or proposed land developments. Where land is high risk such as flood plains, sand dunes, old water courses, or subject to tropical cyclones, land-slide, fill, etc. or subject to other hazards such as flooding, erosion, excessive noise, etc. depending on the risk and extent of the hazard - either should not be developed or should be subject to strict, specific and appropriate engineered building codes. This necessitates the establishment of a total national land usage inventory.
- d. To lobby to have the State and Federal Governments legislate a householders and homeowners insurance including all natural hazards and natural disasters relating to the building and contents at the lowest possible premium. This insurance should be available to all Australian citizens who wish to comprehensively insure their property and possessions.

142.

e. To lobby to have established a Federal and State Natural Disaster Rural Insurance/Bond Scheme to cover all natural disasters not covered by insurance, to primary producers' specifications.

f. To lobby to have all States and Federal Governments pass legislation establishing a reimbursement policy for any public body for repairs necessitated by any natural disaster eg water and sewerage supplies, roads, streets, bridges, employees' time, schools, etc so that no single community bears the cost of these works.

g. To work to have established and/or use existing authorities to research disasters and hazard mitigation or prevention; and to carry out or to see that such work is carried out effectively.

h. To liaise with existing committees, organisations and authorities with similar aims and objective and interest in all States and Territories.

(Amended Constitution of the Natural Disaster Action Committee, 1976).

- Source: Response to Disaster  
Edited by John Oliver  
Collected papers and discussion from the seminar  
"Response to Disaster" held at James Cook  
University of North Queensland, July 16-18, 1979  
Centre for Disaster Studies, James Cook University  
of North Queensland 1980, p 102.



\* Mr Les Lester  
Insurance Council of Australia  
31 Queen Street  
Melbourne, Victoria 3000

NON-RESEARCH ANNEX

(43) 6141077

INVOLVEMENT OF INSURANCE INDUSTRY IN DISASTER MATTERS  
BOTH PRE-DISASTER PLANNING AND POST-DISASTER RECONSTRUCTION

The Insurance Council of Australia has the following functions:

- a. It controls the Operations of the Insurance Emergency Service, the purpose of which is to speedily arrange claim settlements in order to provide financial resources for reconstruction.
- b. The Insurance Emergency Service also provides advice on insurance matters to claimants, authorities, including State Emergency Services, and to financial institutions such as mortgagee banks.
- c. Through Loss Adjusters the Insurance Emergency Service investigates causes of man-made disasters and in some cases, makes recommendations to mitigate the chances of a recurrence of the event.
- d. The Insurance Council of Australia provides a Technical Field Service for the following purposes:
  - (1) In respect to fire suppression systems (ie sprinklers, halon foam and alarm) the Field Service checks plans and proposals and certifies if satisfied, tests completed installations and retests and reinspects old installations. In this area a considerable amount of work is done for Government and semi-Government authorities and Local Authorities.
  - (2) The Field Service section also inspects, appraises and approves electrical installations, often in concert with the State Electricity Commission of Victoria, and locates electrically hazardous areas.
  - (3) It gives advice and insurance approval in respect to factory and process layout and construction.
- e. The Insurance Council of Australia also maintains a computer record of disasters where damage is estimated to exceed \$2M. This information is of significant use to those academic organisations which are studying the cost of certain types of disasters, from local storms to major catastrophes.
- f. The Insurance Council of Australia plays its part in supporting Committees etc established to research and bring down recommendations to mitigate risks (eg Mitigation Committee).

Murdoch University,  
Murdoch, Western Australia 6150 (09) 3322211

Professor M E Nairn,  
Dean, School of Veterinary Studies

Professor Nairn has submitted the following comments concerning research on disaster planning.

"Although we have no one in the Veterinary School who is directly involved with any of the areas relevant to the Disaster Research Directory, it might be useful to point out that I would reasonably expect many veterinarians to be useful resource people in the event of large scale disasters affecting livestock production. For instance, in the event of a nuclear attack, one of the problems involved is the detection of fall-out in both the human and animal population. There would be a large number of veterinarians who would be trained in techniques sufficient to make reasonable interpretations of radiation effects of livestock grazing in potentially contaminated pastures. Although we have no one specifically working in this area, I am sure veterinarians could make a contribution.

Other examples of where veterinarians could be useful for participation in disaster work is in the case of severe bush fires, burning or affecting livestock, there is a need for resource people to make judgements on whether animals should be slaughtered for humane reasons or whether recovery is possible. The supply of fodder as supplementary rations to livestock who have had pastures etc devastated by flood or fire would also be a legitimate role for veterinarians.

Some years ago it was felt that germ warfare may be utilised as a weapon by an invading country. Veterinarians would be in a position to advise on the diagnosis and importance of diseases affecting livestock or food supplies destined for human consumption. National disasters can also occur due to the introduction of exotic diseases, either intentionally or unintentionally. Clearly veterinarians have a very large role to play in such disasters. Examples are: outbreaks of foot and mouth disease where it may be necessary to slaughter thousands of livestock and put rigid control on the movement of animals and personnel."

NRMA Insurance Limited  
151 Clarence Street, Sydney NSW 2000 (02) 236 3211

\* Mr R Lord  
Homecare Claims Manager

This Company maintains a Natural Disaster Plan Manual from which it is clear that the Company, from an Insurer's point of view, is well prepared for a catastrophe involving its clients. The Company is also attempting to work in with the State Emergency Service, Bush Fire Brigade and Police in the event of a catastrophe. A history of "catastrophes" is being compiled so that in the future the Company will be more prepared to handle the situation and will have a better idea of the extent to which the Company would be involved in the matter of staff, equipment and finances.

146.

NON-RESEARCH ANNEX

State Community Committee of the  
New South Wales Disaster Welfare Service,  
C/o the NSW State Emergency Services,  
PO Box Q42, Queen Victoria Building  
SYDNEY. 2000

(02) 267 9207  
Ext 755

- \* Ms Ngaire Chant \*  
Social Worker

The above committee whose name is still subject to ratification was formed in 1978 (as part of the NSW Disaster Plan) by people who had been involved with Cyclone Tracy. The committee produced a plan acceptable to all major welfare organisations in which each organisation is aware of its particular function, and is co-ordinated with other organisations right through from the initial impact to the ultimate rehabilitation of the disaster-affected persons (both "victims" and "helpers"). Ms Chant's particular interests are in personal services. She gives courses, works with people in the various State districts on how to solve personal problems. She trains people on how to organise, and how to appreciate the problems of disaster-affected persons via "experiential" methods. Her work really involves post-disaster situations relating to the re-establishment of social structure, and she identifies herself with those afflicted so that they can be reassured and able to cope eg, with loss and death of relatives. Her work requires a diplomatic approach in dealing with sufferers, namely sympathy and delicacy, and she deplores the case of simply sending in a team of experts to "blatantly" offer money (or other material help) only. The initial requirement is "understanding" the material needs may be required later.

Interests include:

- a. Needs in disaster.
  - b. Organisation to meet needs.
  - c. Stress in rescue workers and in welfare workers, particularly in situations involving injury and death.
  - d. To define a research methodology in readiness for future disasters.
- \* At the time of printing this Directory it was learnt that Ms Chant had terminated the contract with this organisation. Mrs Ann East has been appointed in her stead.

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AUSTRALIAN DISASTER RESEARCH DIRECTORY (INCLUDING SOME  
CONTRIBUTIONS FROM NEW ZEALAND) PROVISIONAL--1983(U)  
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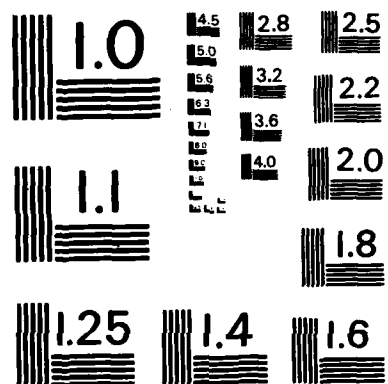
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NATIONAL BUREAU OF STANDARDS-1963-A

NON-RESEARCH ANNEX

Western Australian State Emergency Service  
The State Advisory Committee for the  
Accredited Technical Experts in Natural Disasters (ATEND)  
Scheme (This information has been extracted from the  
Western Australian State Emergency Service publication  
entitled "Operational Instructions for ATEND Accredited  
Personnel".

There is a requirement for the earliest possible collection and collation of information concerning natural disasters, and their effect on buildings, installations and a community generally. This information can be obtained from systematic on the spot investigations of the effects of such a disaster, and from other relevant data sources. The prime purpose of the investigations is to record and evaluate performance under disaster exposure conditions of the materials, products and building and engineering installations so that their technical implications may be evaluated and utilised in an endeavour to reduce the extent of loss or damage to property and perhaps loss of life from similar disasters in the future.

As physical evidence begins to disappear immediately after a disaster, a damage survey should be made by selected accredited personnel to technically assess and record the damage at the disaster site as soon as possible.

The State Advisory Committee for the ATEND Scheme was inaugurated on 22 August 1979 under the Chairmanship of the Principal Architect of the Western Australian Public Works Department. The functions of the State Advisory Committee are:

- a. To approve persons for accreditation and advise the Deputy Premier through the State Counter-Disaster Committee.
- b. Preparation and issue of accreditation cards.
- c. To compile and periodically review a register of available accredited technical experts.
- d. To select from the Register of accredited personnel individuals with appropriate expertise to carry out investigations as necessary, or as directed in disaster areas.
- e. To arrange through the Western Australian State Emergency Service (WASES) for the timing of inspections and for the assembly, transportation, accommodation and conduct of selected accredited personnel.
- f. To receive and evaluate technical reports from and where necessary, to consult with accredited personnel on such reports.
- g. To ensure distribution of technical reports to all interested State and Federal organisations.
- h. To make recommendations.

## Western Australian State Emergency Service (continued)

- i. To circulate periodically a current list of reports available to interested State and Federal organisations.
- j. To receive and evaluate technical reports from other State and Federal organisations and take appropriate action.
- k. To forward copies of the State Register of Accredited Personnel and technical reports to Natural Disasters Organisation, Canberra.

STATE ADVISORY COMMITTEE (ATEND)

<u>Organisation</u>	<u>Member</u>	<u>Deputy</u>
Public Works Dept	Mr W E Bateman DFC ARAIA (Chairman)	Mr R M Fairweather LFRAIA ARIBA AAPTC
Commonwealth Dept of Housing & Const.	Mr J F Buchanan ISO BE MIE Aust	Mr G S Martin BE Hons B Comm MS (Aust)
Department of Local Government	Mr F Hargrave FAIBS	-
Western Australian Fire Brigade	Mr S C Gibbons FIFE, QFSM	Mr J McCarthy FIFE
The University of Western Australia	Dr P C Massey BE BA W Aust PhD (Con- tab), FIE Aust, FNZIE	Mr G C Reynolds ME Adel, MIE Aust
CSIRO	Mr J P Brophy MBE	Dr D R Hudson BSc PhD
School of Engineer- ing & Surveying Western Australia Inst. of Technology	Dr A H Nash BSc(Eng) BSc(Hons) MEd (WA) PhD(Michigan) FIEAust, FACE	Mr S Nowak CEng, MIMEchE, MIProE, MIEAust
Association of Con- sulting Engineers	Mr N T Nedkoff MIE Aust	Mr G N Fernie BE, FICE, FIE Aust
Master Builders Assoc. of WA	Mr R M Torrance AAIB	Dr J K Baron-Hay BE PhD Lond, MIE Aust
Western Australian State Emergency Service	Mr D L Hill (Exec. Officer)	Mr L A Butler



NON-RESEARCH ANNEX

Western Australian Institute of Technology  
Hayman Road  
Bentley, Western Australia 6102

(09) 350 7700

- \* Dr A H Nash  
Dean, Faculty of Engineering and Surveying, and  
Member of State Advisory Committee of the  
Western Australia State Emergency Service

Dr Nash is a member of an organisation in Western Australia which is called ATEND (Accredited Technical Experts in Natural Disasters) (qv). This organisation, which concerns itself with all natural disasters, has set up a system whereby specialist panels are flown in immediately to a disaster area to completely research the effects on physical objects so that preventive steps can be set in motion in coping with future events. Future work will be in connection with earthquakes and the minimising of their effect. The West Australian State Advisory Committee Executive Officer, Mr Dean Hill, is also responsible for other aspects of natural disasters such as trauma, warning procedures and social welfare.

There are no under-graduate courses in disaster topics but there is a Woodside Off-shore safety course conducted at management level by the subsidiary WAIT-Aid. There are moves to get off-shore engineering programs started at post-graduate level, although there is limited work in off-shore vehicles etc. currently in hand.

The Young Lawyers,  
The Law Institute of Victoria,  
470 Bourke Street,  
Melbourne Vic. 3000

(03) 602 3922

- \* Kevin Andrews

The Young Lawyers has been established only a few months. The aim of this organization is to set up an emergency legal service to help people who have suffered the effects of a disaster to find lawyers conversant with disaster situations.

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88